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THE PRESENT PROBLEMS OF GEOGRAPHY.

AN ADDRESS DELIVERED TO THE INTERNATIONAL CONGRESS OF ARTS AND SCIENCES AT ST. LOUIS IN 1904.

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The present problems of a science may, I hope, be viewed as those problems the solution of which at the present time is most urgent and appears most promising. Were present problems held to include the whole penumbra of our ignorance, I at least have neither the desire nor the competence to discourse upon them. So much has been written on the problems of geography in recent years that a detailed summary of the existing literature would be a ponderous work, and afford much dull and contradictory reading. I cannot even attempt to associate different views of the problems of geography with the names of their leading exponents, though, perhaps, if I were to do so, I should quote with almost entire approval the masterly address recently delivered to the American Association for the Advancement of Science by Prof. W. M. Davis.

Believing that every geographer should approach such a question as this by the avenue of his own experience, I offer a frankly personal opinion, the outcome of such study, research, and intercourse with kindred workers as have been possible to me during the last twenty years. The views I hold may not be representative of European, perhaps not even of British, geographical opinion, except in so far as they are the result of assimilating, more or less consciously, the writings and teachings of geographical leaders in all countries, retaining congenial factors, and modifying or reject-

ing those which were foreign to the workings of my own partially-instructed mind.

The history of every branch of science teaches that time works changes in the nature and the value of the problems of the hour. In successive ages the waves of existing knowledge make inroads upon the shores of ignorance at different points. For one generation they seem to have been setting, with all their force, against some one selected point; in the next they are encroaching elsewhere, the former problem left, it may be, partially solved; but gradually the area of the unknown is being reduced on every side, however irregularly.

In the beginning of geography the problem before all others was the figure of the Earth. Scientific progress, not in geography alone but in all science, depended on the discovery of the truth as to form. No sooner was the sphericity of the Earth established than two fresh problems sprang to the front, neither of them new, for both of them existed from the first—the fixing of position on the sphere and the size of the Earth. Geography, and science as a whole, progressed by the failures as well as by the successes of the pioneers who struggled for centuries with these problems. Latitude was a simple matter, theoretically no problem at all, but a direct deduction from the Earth's form, though its determination was practically delayed by difficulties of a mechanical kind. The problem of the longitude was far more serious, and it bulks largely in the history of science. Pending their solution, the estimates of size were rough guesses; had they been more accurate it is doubtful if Columbus could have persuaded any sane sailor to accompany him on his westward voyage to India, the coast of which he was not surprised to find so near to Spain as the Caribbean Sea.

After latitude could be fixed to a nicety, and longitude worked out in certain circumstances with nearly equal accuracy, the size of the Earth was determined within a small limit of error and the problem of geography shifted to detailed discovery. This phase lasted so long that even now it hardly excites surprise to see an article or to open a volume on the history of geography which turns out to be a narrative of the progress of discovery. Perhaps British geographers, more than others, were prone to this error, and for a time the country foremost in modern discovery ran some risk of falling to the rear in real geography.

It is not so paradoxical as it seems to say that the chief problem of geography at present is the definition of geography. Some learned men have said within living memory, and many have

thought, that geography is not a science at all, that it is without unity, without a central theory, that it is a mere agglomerate of scraps of miscellaneous information regarding matters which are dealt with scientifically by astronomers, geologists, botanists, anthropologists, and others. Geography is not so circumstanced. Although its true position has only recently been recovered from oblivion, it is a science, and one of long standing.

I have said before,* and I may repeat, because I can say it no better, that modern geography has developed by a recognizable continuity of change from century to century. I am inclined to give more weight than others have done to the remarkable treatise of Dr. Nathaniel Carpenter, of Exeter College, Oxford, published in 1625, as a stage in the growth of geographical thought and theory. The striking feature of Carpenter's book is the practical assertion of the claims of common sense in dealing with questions of superstition and tradition. Varenius, who died at the age of twenty-eight, published in 1650 a single small volume, which is a model of conciseness of expression and logical arrangement well worthy even now of literal translation into English. From several points in its arrangement I am inclined to believe that he was influenced by Carpenter's work. So highly was Varenius's book thought of at the time that Sir Isaac Newton brought out an annotated Latin edition at Cambridge in 1672. The opening definition as rendered in the English translation of 1733 (a work largely spoilt by stupid notes and interpolations) runs—

> Geography is that part of *mixed mathematics* which explains the state of the Earth and of its parts, depending on quantity, viz., its figure, place, magnitude and motion with the celestial appearances, etc. By some it is taken in too limited a sense, for a bare description of the several countries; and by others too extensively, who along with such a description would have their political constitution.

Varenius produced a framework of Physical Geography capable of including new facts of discovery as they arose; and it is no wonder that his work, although but a part, ruled unchallenged as the standard text-book of pure geography for more than a century. He laid stress on the causes and effects of phenomena as well as the mere fact of their occurrence, and he clearly recognized the influence upon different distributions of the vertical relief of the land. He did not treat of human relations in geography, but, under protest, gave a scheme for discussing them as a concession to popular demands.

As Isaac Newton the mathematician had turned his attention

* British Assoc. Reports—Presidential Address in Section E. Glasgow, 1901.

to geography at Cambridge in the earlier part of the eighteenth century, so Immanuel Kant the philosopher lectured on the same subject at Königsberg in the later part. The science of geography he considered to be fundamentally physical, but physical geography formed the introduction and key to all other possible geographies, of which he enumerated five: *mathematical*, concerned with the form, size, and movements of the Earth and its place in the solar system; *moral*, taking account of the customs and characters of mankind according to their physical surroundings; *political*, concerning the divisions of the land into the territories of organized governments; *mercantile*, or, as we now call it, commercial geography; and *theological*, which took account of the distribution of religions. It is not so much the cleavage of geography into five branches, all springing from physical geography, like the fingers from a hand, which is worthy of remark, but rather the recognition of the interaction of the conditions of physical geography with all other geographical conditions. The scheme of geography thus acquired unity and flexibility such as it had not previously attained, but Kant's views have never received wide recognition. If his geographical lectures have been translated, no English or French edition has come under my notice; and such currency as they obtained in Germany was checked by the more concrete and brilliant work of Humboldt and the teleological system elaborated in overwhelming detail by Ritter.

Ritter's views were substantially those of Paley. The world, he found, fitted its inhabitants so well that it was obviously made for them down to the minutest detail. The theory was one peculiarly acceptable in the early decades of the nineteenth century, and it had the immensely important result of leading men to view the Earth as a great unit with all its parts co-ordinated to one end. It gave a philosophical, we may even say a theological, character to the study of geography.

Kant had also pointed to unity, but from another side—that of evolution. It was not until after Charles Darwin had fully restored the doctrine of evolution to modern thought that it was forced upon thinking men that the fitness of the Earth to its inhabitants might result, not from its being made for them, but from their having been shaped by it. The influence of the terrestrial environment upon the life of a people has been insisted upon too strongly by some writers—by Buckle, in his "History of Civilization," for example—but it is certain that this influence is a potent one. This relation between the forms of the solid crust of the

Earth and all the other phenomena of the surface constitutes the very essence of geography.

It is a fact that many branches of the study of the Earth's surface which were included in the cosmography of the sixteenth century, the Physiography of Linnæus, the Physical Geography of Humboldt, and perhaps even the "Erdkunde" of Ritter, have been elaborated by specialists into studies which, for their full comprehension, require the whole attention of the student; but it does not follow that these specializations fully occupy the place of geography, for that place is to co-ordinate and correlate all the special facts concerned so that they may throw light on the plan and the processes of the Earth and its inhabitants. This was clear to Carpenter in 1625, though it has been almost forgotten since.

The principles of geography on which its claims to status as a science rest are generally agreed upon by modern geographers, though with such variations as arise from differences of standpoint and of mental process. The evolutionary idea is unifying geography as it has unified biology, and the whole complicated subject may be presented as the result of continuous progressive change brought about and guided by the influence of external conditions. It is impossible to discuss the present problems of geography without once more recapitulating the permanent principles.

The science of geography is, of course, based on the mathematical properties of a rotating sphere; but there is force in Kant's classification, which subordinated mathematical to physical geography. The vertical relief of the Earth's crust shows us the grand and fundamental contrast between the oceanic hollow and the continental ridges; and the hydrosphere is so guided by gravitation as to fill the hollow and rise upon the slopes of the ridges to a height depending on its volume, thus introducing the great superficial separation into land and sea. The movements of the water of the ocean are guided in every particular by the relief of the sea-bed and the configuration of the coast-lines. Even the distribution of the atmosphere over the Earth's surface is affected by the relief of the crust, the direction and force of the winds being largely dominated by the form of the land over which they blow. The different physical constitution of land, water, and air, especially the great difference between the specific heat and conductivity or diathermancy of the three, causes changes in the distribution of the sun's heat, and as a result the simple climatic zones and rhythmic seasons of the mathematical sphere are distorted out of all their primitive simplicity. The whole irregular distribution of rainfall and aridity,

of permanent, seasonal, and variable winds, of sea climate and land climate, is the resultant of the guiding action of land-forms on the air and water currents, disturbed in this way from their primitive theoretical circulation. So far we see the surface-forms of the Earth, themselves largely the result of the action of climatic forces, and constantly undergoing change in a definite direction, controlling the two great systems of fluid circulation. These in turn control the distribution of plants and animals, in conjunction with the direct action of surface relief, the natural regions and climate belts dictating the distribution of living creatures. A more complicated state of things is found when the combined physical and biological environment is studied in its incidence on the distribution of the human race, the areas of human settlement, and the lines of human communication. The complication arises partly from the fact that each of the successive earlier environments acts both independently and collectively; but the difficulty is in greater degree due to the circumstance that man alone among animals is capable of reacting on his environment and deliberately modifying the conditions which control him.

I have said before, and I repeat now, that the glory of geography as a science, the fascination of geography as a study, and the value of geography in practical affairs arise from the recognition of this unifying influence of surface relief in controlling, though in the higher developments rather by suggestion than dictation, the incidence of every mobile distribution on the Earth's surface. I am inclined, in the light of these views, to put forward a definition of geography which I think may be accepted in principle, if not in phrase, by most of the class called by Prof. Davis "mature geographers" on both sides of the Atlantic. It runs:

Geography is the science which deals with the forms of relief of the Earth's crust and with the influence which these forms exercise on the distribution of all other phenomena.

The old pigeon-hole view of human knowledge is now happily discredited and recognized as useless, save, perhaps, by some Rip van Winkles of science, who concern themselves more with names than things, and would cheerfully misconceive the facts of nature to fit the framework of their accepted theories. High specialism is necessary to progress, but only as a phase of a working life, not as the whole purpose of a whole man.

It is convenient and often profitable for a man of science to have a recognized label, but it seems to me that important advances are to be made by cultivating those corners of the field of knowledge

which lie between the patches where the labelled specialists toil in recognized and respected supremacy. It has been so habitual to classify the man of science by what he works in that it requires something of an effort to see that the way in which he works is of greater determinative importance. Thus the scientific geographer is apt to find no place in the stereotyped classification, and his work may be lost sight of on that account. Should he dwell on latitude and longitude, the astronomer smiles pityingly; if he looks at rocks, the geologist claims that department; if he turns to plants, the botanist, with the ecologist behind him, is ready to warn him off; and so with other specialists. But the mature geographer seeks none of the territory, and hankers after none of the gold-fields belonging to recognized investigators. He works with the material they have already elaborated, and carries the process a step farther, like the goldsmith handling the finished products of the metallurgist and the miner.

The present problems of geography seem to me to be of two kinds—the first minor and preliminary, the completion of the unsolved and partially-solved problems of the past; the second ultimate and essential, dealing with the great problem on the solution of which the whole future of the science rests.

The residual problems inherited from the past represent the work which should have been done by our predecessors, but, not having been done at the right time, remains now to bar our progress. It has to do only with ascertaining and accurately recording facts, and involves infinite labour but comparatively little geographical thought.

To begin with, the ground should be cleared by wiping off the globe the words *terra incognita*. Such unknown parts of the Earth now cling about the poles alone, and that they should even do this is a disgrace to us. If common terrestrial globes were pivoted on equatorial points, so that the polar areas were not covered with brass mountings, I think the sight of the bare patches would have been so galling to the pride of humanity that they would long since have been filled in in detail. Again and again, and never more splendidly than in recent years, polar explorers have shown courage and perseverance, and have cheerfully encountered hardships enough to have enabled them to reach the poles; and they would have done so, not once but many times, were it not for the want of money. Of course, all polar explorers have not been competent for the task they undertook; but most of the leaders, if they had had more powerful ships, more coal, more stores, more dogs—and

sometimes if they had had fewer men—could have solved these perennial problems of exploration. With a competent man in command—and competent men abound—a sufficiency of money is all that is required. A million dollars judiciously spent would open the way to the north pole, a few millions would reach the south pole; but far more than this has been spent in vain because the money was doled out in small sums at long intervals, sometimes to explorers with no real call to the quest and working in accordance with no scientific plan.

The grand polar journeys of Nansen, Peary, and Cagni in the north, and of Scott and his company in the south, promise well for an early solution of this particular problem.

The other residual problems of exploration and survey are in the same case. If those who control money saw it to be their duty to solve them, they would all be solved, not in a year, but in due time. Though a great deal of exploration remains to do, the day of the ignorant explorer is done. The person who penetrates a little-known country in search of adventures or sport, or in order to go where no one of his colour or creed has been before, is, from the geographical point of view, a useless wanderer; and if he be a harmless wanderer, the true explorer who may follow in his footsteps is uncommonly fortunate. Exploration now requires, not the pioneer, but the surveyor and the student.

The map of the world ought to be completed, and it is the duty and, I believe, the interest of every country to complete that portion which includes its own territory. An imperial policy which ignores such an imperial responsibility is a thing of words and not of deeds. Unsurveyed and unmapped territory is a danger, as well as a disgrace, to the country possessing it; and it would hardly be too much to say that boundary disputes would be unknown if new lands were mapped before their mineral wealth is discovered. The degree of detail required in any survey depends upon the importance of the region. The desideratum is not a large-scale map of every uninhabited island, but a map of the whole Earth's surface on the same scale, which for the present may be a small one, and might very well be that of 1:1,000,000 proposed by Prof. Penck, and now being carried into effect for many of the surveyed portions of the land. Such a map ought to include sub-aqueous as well as sub-aërial features, and when completed it would form a solid basis for the full discussion of many problems which at present can only be touched upon in a detached and unsatisfactory manner. The first problem which it would solve is the measurement of the volume of

the oceanic waters and of the emergent land, so that the mean depth of the oceans and the mean heights of the continents may be exactly determined. This would involve, besides the horizontal surveys, a vertical survey of considerable accuracy. At sea the vertical element is easily found, and the depths measured by surveying and exploring vessels in recent years are very accurate. They must, however, be made much more numerous. On land, outside the trigonometrically-surveyed and spirit-levelled countries, the vertical features are still most unsatisfactorily delineated. Barometric determinations, even when made with mercurial barometers or boiling-point thermometers, are uncertain at the best, while when made with aneroids they afford only the roughest approximations to the truth. Where levelling is impracticable, angular measurements of prominent heights, at least, should be insisted on as an absolute necessity in every survey.

When a map of the whole surface of the Earth on the scale of 1:1,000,000 is completed, we may consider the residual problems as solved. This is far from being the case as yet, and in the present circumstances the most useful work that the geographical societies of the world could do would be to secure the completion of exploratory surveys to that scale. The system of instruction for travellers established by the Royal Geographical Society has equipped a large number of explorers and colonial officials as expert surveyors, and the result is now being felt in every quarter of the globe. This is not the highest geographical work, but merely preliminary and preparatory; yet progress is checked, if not barred, until it is accomplished. The map of one to a million is not to be viewed as an end in itself; nevertheless its completion will mark an era—the accomplishment of the small-scale survey of the globe.

Money could solve the last of the problems of exploration, but when we come to problems of the second category we enter a region of pure science, where money becomes a minor consideration. The acquisition of knowledge is a simple process, for which multitudes have a natural aptitude; but the co-ordination of knowledge and its advancement are very different matters. The difference is more marked in the case of geography than in geology or chemistry or physics; for, in English-speaking countries at least, the training of geographers is in its infancy, whilst that of the exponents of other sciences is highly developed. Hence it happens that before any actual problem in geography can be attacked, the man who is to deal with it must be prepared on purpose for the task, and he must have determination enough to stick to an unpopular subject with

little encouragement in the present and small prospects for the future. Such men are not too easily found.

If they can be found, the problems to which they should be set are at hand and waiting. We know enough about the relations of mobile distributions to fixed environments to feel satisfied that the relations are real and of importance; but we do not yet know enough to determine exactly what the relations are and the degree in which they apply to particular cases. It is the aim of geography to find this out, and to reduce to a quantitative form the rather vague qualitative suggestions that have been put forward. The problem is multiform and manifold, applying to a vast range of phenomena, and those who have surveyed it are often inclined to sigh for a Kepler or a Newton to arise and call order from the chaos.

A vast amount of material lies before the geographer with which to work, even though, as has been explained, much more is needed before the data can be looked upon as complete. After seeing that the missing facts are in course of being supplied, the great thing is to work and to direct the work of others towards the proper comprehension of the facts and their bearings. This involves as much the checking and discouragement of work in wrong or useless directions as the help and encouragement of well-directed efforts.

The first element of geography is the configuration of the crust of the Earth, and our knowledge is already ripe for a systematic classification of these forms and for a definite terminology by which to describe them. For some reason not easy to discover geographical terms, with the exception of those handed down from antiquity, have not, as a rule, been taken from the Greek, like other scientific terms. They have usually been formulated in the language of the author who has introduced them. For this reason they retain a national colour, and, absurd as it may seem to scientific reflection, national or linguistic feeling is sometimes a bar to their general adoption. A more serious difficulty is that different languages favour different modes of thought, and thus lead to different methods of classification. The clearness and definiteness of French conduce to the use of simple names and the recognition of definite features, distinguished by clear differences. The facility for constructing compound words presented by German lends itself to the recognition of composite types and transition forms, the introduction of which often swells a classification to an almost unmanageable complexity. English stands intermediate

between those languages, less precise, perhaps, than French, certainly less adaptable than German, and English terminologies often reflect this character. The best way out of the difficulty seems to be to endeavour to arrive at a general understanding as to a few broad types of land-form which are recognized by every one as separate and fundamental and then to settle equivalent terms in each important language by an international committee, the finding of which would have to be ratified by the national geographical societies. These terms need not necessarily be identical, nor even translated literally from one language into another, but their equivalence as descriptive of the same form should be recognized. A recent international committee appointed for the nomenclature of the forms of sub-oceanic relief put forward certain suggestions in this direction which might well be adapted to the forms of sub-aërial relief as well. But there are strong-willed geographers who will recognize no authority as binding, who will not, I fear, conform to any scheme which might threaten their liberty to call things as they please.

Personally, I would go very far to obtain uniformity and agreement on essential points, but the only way to do so seems to be to arrive by general agreement at a classification that is as brief, simple, and essential as possible.

It is necessary to classify land-forms according to their resemblances and differences, so that similar forms may be readily described, however far apart they may be. The fixed forms of the crust are the foundation of all geography, the ultimate condition underlying every distribution, the guiding or controlling resistance in every strictly geographical change. The question of place-names is altogether subordinate. It is convenient that every place should have a name, and desirable that the name should be philologically good, but the national boards of geographic names, geographical societies, and survey departments see to that, and do their work well. The question of terminology is far more difficult, and, I think, more pressing.

The grand problem of geography I take to be the demonstration and quantitative proof of the control exercised by the form of the Earth's crust upon the distribution of everything upon the surface or in contact with it which is free to move or to be moved. It is a great problem, the full solution of which must be long delayed, but every part of it is a bud with minor problems of detail, alike in nature but differing widely in degree. These minor problems claim our attention first, and are so numerous that one fears to

attempt their enumeration because of the risk of distracting attention from the main issue. Geography was defined long ago as the science of distribution; but the old idea was statical distribution, the laying down on maps of where things are; now we must go farther, and discuss also how the things came there, why they remain there, whether they are in transit, and, if so, how their path is determined. We now look on distribution from its dynamical side, the Earth with all its activities being viewed as a machine at work.

The geographer, as an independent investigator, has to deal only with matters touching or affected by the crust of the Earth; his subject is limited to a part only of the economy of the Kosmos.

The quantitative relationships of crustal control have to be worked out for different areas with different degrees of detail. A great deal has been done already, and the material for much more has been collected in a form fit for use. The first step in commencing such a discussion is the accurate mapping of all available data—each kind by itself—for the particular area. On the national and almost continental scale this is done better in the United States Census Reports than in any other works known to me. An adequate discussion of all that is shown in the maps accompanying these Reports, and in those of the Coast and Geodetic Survey, the Geological Survey, and the Department of Agriculture, would be a complete and almost an ideal geographical description. The material provided in such rich profusion by the Federal and State Governments is being used in Harvard and elsewhere with an originality and thoroughness that have developed the conception of geography and advanced its scientific position. American geographers more than others have grasped the dynamic idea of geography, and realized that the central problem is the elucidation of the control or guidance exercised by fixed forms on mobile distributions.

Detailed work in the same direction has been done by many European geographers, whose works are too well known to require citation; but the geographical treatment of statistics has not been taken up adequately by public departments in the countries east of the Atlantic. To touch only on the instance most familiar to me, with the exception of the maps of the Admiralty, Ordnance and Geological Surveys, which cannot be surpassed, the maps issued by British Government Departments in illustration of their reports are rarely more than diagrams delimiting the areas dealt with, but not depicting the distributions. This is the more regrettable because the accuracy and completeness of the statistics in the reports are

inferior to none and superior to most work of a similar character in other countries. As frequently happens, private enterprise has stepped in where official action is wanting, and it is a pleasure to the geographer to turn to the recent work of Mr. J. G. Bartholomew, especially the volume of his great Physical Atlas, the Atlas of Scotland published some years ago, and the Atlas of England and Wales which has just left the press. Both of the latter works contain general maps based on statistics that have not been subjected to cartographic treatment before, and attention may be drawn in particular to the singularly effective and suggestive mapping of density of population. Another work similar in scope and no less creditable to its compilers is the Atlas of Finland, prepared by the active and enlightened Geographical Society of Helsingfors. In Germany, France, and Russia, also, examples may be found of good work of this kind, sufficient to whet the desire for the complete and systematic treatment of each country on the same lines.

It seems to me that the most useful application of youthful enthusiasm in geography, such as breaks forth in the doctoral theses of German universities, and is solicited in the programme of the Research Department of the Royal Geographical Society, would be towards the detailed comparison of the distribution of the various conditions dealt with statistically in Government Reports with the topographical map of selected areas. The work would, of course, not stop with the maps; for these, when completed, should be tested and revised as fully as possible on the ground, since geography, be the scale large or small, is not advanced by maps alone.

Such small portions of the co-ordination of existing surveys are at the best no more than fragments of a complete scheme, but they show what can be done with existing surveys and actual statistics, and where these may be appropriately reinforced by new work. I have treated a special case of this kind pretty fully in papers, to which it is only necessary to refer.* One section of the scheme outlined and exemplified in these papers is the distribution of rainfall viewed in relation to the configuration of the land; and with the active assistance of nearly four thousand observers in the British Isles, I feel that there is some prospect, though it may lie far in the future, of ultimate results from that study.

The system of botanical surveys now being carried on with signal success in many countries is in some ways even more inter-

* *Geographical Journal*, 7 (1896), 345–364; 15 (1900), 205–226, 353–377.

esting. It includes the mapping of plant associations and the discussion of their relation to altitude, configuration, soil, and climate. Such phenomena are comparatively simple, and the influence of the various modifications of geographical control is capable of being discovered. I need only mention the similar problems in animal distribution, both on land and in the sea, to the elucidation of which many able workers are devoting themselves.

Difficulties increase when the more complicated conditions of human activity are taken into account. The study of the geographical causes determining, or assisting to determine, the sites of towns, the lines of roads and railways, the boundaries of countries, the seats of industries and the course of trade is full of fascination and promise. It has yielded interesting results in many hands; above all, in the hands of the leading exponent of anthropogeography, the late Prof. Ratzel, of Leipzig, whose sudden death last month is a grievous loss to geographical science.* Had he lived he might have carried the lines of thought which he developed so far to their logical conclusion in the formulation of general laws of universal application; but that task devolves on his disciples. Separate efforts in small and isolated areas are valuable, but a much wider basis is necessary before general principles that are more than hypotheses can be deduced. For this purpose there must be organized co-operation, international if possible, but, in the present condition of things, more probably on a national footing for each country. To be effective the work would have to be on a larger scale and to be continued for a longer time than is likely to appeal to an individual or a voluntary association. One experienced geographer could direct an army of workers, whose task would be to collect materials on a properly thought-out plan, and from these materials the director of the work could, before long, begin to produce results which will not probably be sensational, but will be accurate and thorough—which is far better. The director of such a piece of work must be free to disregard the views of the collectors of the facts with which he deals if, as may very well happen, these views are at variance with scientific principles.

A complete geographical description should commence with a full account of the configuration of the selected area, and in this I lay less stress than some geographers feel it necessary to do upon the history of the origin of surface-features. The features themselves control mobile distributions by their form, irrespective of the

* Prof. Ratzel died August 9, 1904.

way in which that form was produced; and although considerations of origin are often useful and always interesting, they are apt to become too exclusively geological. The second point to discuss is the nature of the actual surface, noting the distribution of such geological formations as volcanic rocks, clays, limestones, sandstones, and economic minerals, the consistency and composition of the rocks being the points to which attention is directed, the geological age an entirely subordinate matter. To this must be added a description of the climate as due to latitude, and modified by altitude, exposure, and configuration, then the distribution of wild and cultivated plants in relation to their physical environment, and of the industries depending on them, and on other natural resources. As the conditions increase in complexity, historical considerations may have to be called in to aid those of the actual facts of to-day. The lines of roads and railways, for example, are usually in agreement with the configuration of the localities they serve; but anomalies sometimes occur the explanation of which can only be found by referring to the past. The more transitory features of a country may have acted differently at different times in affording facilities or interposing barriers to communication. The existence of forests long since destroyed, of marshes long since drained, of mineral deposits long since worked out, or of famous shrines long since discredited and forgotten, account for many apparent exceptions to the rules of geographical control. In long-settled countries the mobile distributions do not always respond immediately to a change of environment. A town may cease to grow when the causes that called it into existence cease to operate, but it may remain as a monument of former importance and not wither away. As one ascends in the geographical system, the mobility of the distributions which have to be dealt with increases, and the control of crust-forms upon them diminishes, and non-geographical influences play an increasing part. It may even be that causes altogether outside of geographical control account for the persistence of worn-out towns, the choice of sites for new settlements, or the fate of existing industries. If this be really so, I think it happens rarely, and is temporary. Geographical domination, supreme in simple conditions of life, may be modified into geographical suggestion, but in all stable groupings or continuous movements of mankind the control of the land on the people will surely assert itself. How? and To what degree? are the questions to which the modern geographer must seek an answer.

A special danger always menaces the few exponents of modes of study which are not yet accepted as of equal worth with those of the conventional sciences. It is the nemesis of the temptation to adopt a plausible and probably true hypothesis for the demonstrated truth, and to proclaim broad and attractive generalizations on the strength of individual cases. Geographers have perhaps fallen into the error of claiming more than they can absolutely prove in the effort to assert their proper position; but the fault lies mainly at other doors. In geography it is not always easy to obtain exact demonstrations, or to apply the test of accordance with fact to an attractive hypothesis; and it is necessary to be on guard against the publication of attractive speculations as if they were established truths. The methods of journalism—even of the best journalism—are to be absolutely discouraged in science. The new is not necessarily truer or better than the old simply because it is new, and we must remember that time alone tests theories. It is a danger to become too popular. The scientific study of geography should be carried on with as many safeguards of routine verification and patient repetition—and, it may be, within as high a fence of technical terminology—as, say, physiology, before the results can be obtained. Unfortunately the idea is prevalent that geography is an easy subject, capable of being expounded and exhausted in a few popular lectures. I regret to see the growing tendency amongst teachers of geography to deprecate the acquisition of facts, to shorten and "simplify" all chains of reasoning, to generalize over the heads of clamant exceptions, and even to use figures, not as the ultimate expression of exact knowledge but merely as illustrations of relative magnitude. I quite allow that all this may be legitimate and laudable in the early stages of elementary education; but it should never pass beyond this, and every vestige of such a system of evading difficulties should be purged from the mind of the aspirant to research.

The facts available are neither so well known nor so easily accessible as they should be. Much has been done towards the indexing of the current literature of all sciences, and geography is peculiarly fortunate in possessing the exhaustive annual volumes of the *Bibliotheca Geographica*, published by the Berlin Geographical Society, the carefully-selected annual bibliography of the *Annales de Géographie*, the critical and systematic chronicles of the *Geographisches Jahrbuch*, and the punctual monthly lists of the *Geographical Journal* and *Petermanns Mitteilungen*, not to speak of the work of the "International Catalogue of Scientific Literature." A

great desideratum is an increase in the number of critical bibliographies of special subjects and particular regions, prepared so carefully as to relieve the student from the necessity of looking up any paper without being sure that it is the one he requires to consult, and to save him from the weary labour of groping through many volumes for fragmentary clues. In addition to the sources of information usually catalogued in one or other of the publications cited, there exist in every country numbers of Government reports and quantities of periodical statistics too valuable to deserve their usual fate of being compiled, printed, and stored away and forgotten. There is scope for a great deal of hard but very useful and permanently valuable work in throwing all these open to working geographers by providing analytical indexes. This would make it easier to discuss current Government statistics with the highest degree of precision, and to compare past with present distributions. All such statistics should be subject to a cartographical treatment no less rigidly accurate than the ordinary arithmetical processes.

The ultimate problem of geography may, perhaps, be taken as the determination of the influence of the surface-forms of the Earth on the mental processes of its inhabitants. But a host of minor problems must be solved in cutting the steps by which that culmination is reached. Let us first find the exact relationship between the elevation, slope, and exposure of land on climate; then the true relation between elevation, slope, soil, exposure, and climate on vegetation; then the actual relation between all these and agriculture, mining, manufacture, trade, transport, the sites of towns, the political associations of peoples, and the prosperity of nations. After that we may consider whether it is possible to reduce to a definite expression the relation between the poetry or the religion of a people and their physical surroundings. The chemist Chenevix wrote a book in two volumes a hundred years ago to demonstrate the inferiority of a certain nation, against one of whose citizens he bore a personal grudge, and he was bold enough to attempt to justify the formula $C = f\lambda$, where C represented civilization, λ the latitude, and f a function so delicately adjusted as to make the value of C negative on one side of a channel twenty miles wide and positive on the other! We cannot hope to arrive by any scientific process at so definite a formula, but the only way of getting there at all is by forging the links in as unbroken a chain of cause and effect as that which led from the "house that Jack built" to "the priest all shaven and shorn."

The last of the problems of geography on which I intend to touch is that of the training of geographers. So far as elementary instruction in geography is concerned I have nothing to say, except that it was bad, it is better, and it seems likely that it will be very good. But between geography as part of the education of a child and geography as the whole life-work of a man there is a gulf as wide as between nursery rhymes and the plays of Shakespeare. The training of an elementary teacher in geography should be more thorough and more advanced than that of a child, but it need not be of a different order. The teacher, whose special function is teaching, must, like the child, accept the facts of geography from the authorities who are responsible for them. Although the two gifts are sometimes happily combined, an excellent teacher may make but a poor investigator.

A would-be geographer has at present adequate scope for training in very few universities outside Germany and Austria. Great advances have been made in the United States, but it is only here and there amongst the universities that steps have been taken to secure men of the first rank as professors who are not only channels of instruction but masters of research as well. In the United Kingdom there are lecturers on geography at several universities and many colleges; and, although they have done good work, the system adopted fails, in my opinion, on a practical point—the lecturers are so inadequately paid that they cannot afford to give their whole time or their undivided attention to the subject with which they are charged. In such conditions progress cannot be rapid, and research is almost impossible. The absence of any well-paid posts, by attaining which a geographer would be placed in a position equivalent to that of a successful chemist or mathematician or botanist, kills ambition. The man with his income to make cannot afford to give himself wholly to such a study, however great his predilection for it. The man with as much money as he wants rarely chooses "to scorn delights and live laborious days," and—with some bright exceptions—he has a tendency, when he turns to science at all, to study it rather for his own satisfaction than for the advance of the subject or the help of his fellows. We want some adequate inducement for solid scientific workers, well trained in general culture, and fitted to come to the front in any path they may select; to devote their whole attention—and the whole attention of such men is a tremendous engine—to the problems of geography. The labourer is worthy of his hire, and the services of the most capable men cannot reasonably be expected if

remuneration equivalent to that offered to men of equal competence in other subjects is not available. At some American and several German universities such men can receive instruction from professors who are masters of the science, free to undertake research themselves and to initiate their students into the methods of research—the best training of all.

If the time should come when there are, perhaps, a dozen highly-paid professorships in English-speaking countries, several dozen aspirants will be found, including, we may hope, a few more gifted than their masters, all qualifying for the positions, stimulated by rivalry, and full of the promise of progress. This is not an end, but the means to an end. Rapid progress is impossible without the stimulus of the intercourse of keenly-interested and equally-instructed minds. Geography, like other sciences, has to fight its way through battles of controversy, and smooth its path by wise compromises and judicious concessions, before its essential theory is established and universally accepted. We can already see, though somewhat dimly, the great principles on which it depends, and they are becoming clearer year by year. As they are being recognized they may be applied in a provisional way to current problems of practical life. The world is not yet so fully dominated by the highest civilization, nor so completely settled, as to deprive geographers of an opportunity of showing how the settlement and development of new lands can best be carried out in the light of the permanent relationships between land and people discovered by the study of the state of matters of long-settled areas at the present day and in the past.

The practical politician, unfortunately, thinks little of geographical principles, and hitherto he has usually neglected them utterly. Many burning questions that have disturbed the good relations and retarded the progress of nations, even when they did not burst into the conflagration of war, would never have got alight had the consequences of some apparently trifling neglect, or some careless action, been understood beforehand as clearly by the man of affairs as by the student of geographical principles. Perhaps when geography has obtained the status in the world of learning to which its ideals and achievements entitle it the geographer may be permitted, when the occasion demands, to assist in saving his country from extravagance or disaster.

WORK ON THE U. S. TOPOGRAPHIC ATLAS.

The season just closed has been an active one for the topographic office of the United States Geological Survey. The eastern division of the topographic branch has had nearly fifty parties at work in various portions of about twenty States. The greatest activity has been in the States of New York, Pennsylvania, Ohio, and West Virginia. In the central and southern States a large amount has been in progress, as also in Wisconsin, Missouri, Kentucky, and Alabama.

In New York primary triangulation or primary traverse has been extended for the control of future mapping into portions of Cattaraugus, Wyoming, and neighbouring counties, and into Lewis and St. Lawrence counties, in the northern part of the State. Many quadrangles were completed in Erie, Wyoming, Oswego, Lewis, Hamilton, Sullivan, and Orange counties. Of most interest has been the mapping of nearly all the unsurveyed portions of the western Catskills, including Slide Mountain and Ellenville quadrangles, and a large amount of preliminary work has been extended to Goshen and Port Jervis. Another interesting area is in that portion of the southern Adirondacks covered by the Piseco and Lake Pleasant quadrangles, thus practically completing the southern portion of the Adirondack survey, including the drainage of the Sacandaga River, concerning which there has been little topographic information heretofore available. That part of the State which most nearly approaches a *terra incognita*, situated in southwestern Lewis county, and covered by the Highmarket, Mexico, and Kasoag sheets, has been mapped, thus giving for the first time some definite information regarding the peculiar topographic formation of this region. It appears to be one of comparatively recent geologic origin; an upland or tableland of nearly 500 square miles, with an altitude of from 1,850 to 2,050 feet.

In Maine an interesting region about Rockland has been mapped, and lines of precise levels have been run up the entire length of the Kennebec River, determining its slope, etc., from tide-water to Moosehead Lake outlet, and up the Penobscot River from tide-water to Norcross, which is at the outlet of the Twin Lakes. Some preliminary mapping has been done also on the headwaters of the Kennebec, just below Moosehead Lake, a comparatively inacces-

sible country, without roads or trails, and difficult to penetrate because of the second growth following lumber operations.

In New Hampshire an important area near Nashua has been mapped, where the country has been found to be highly eroded and, in spite of dense habitation in portions, quite wild and overgrown with timber. In addition, lines of precise levels have been run from Manchester *via* Concord to Sunapee Lake, thus extending tide-water elevations into a region in which accurate determinations of height were previously unknown. In Vermont an important area has been mapped in the neighbourhood of Burlington and Essex Junction. In this region a peculiar error in the geodetic location of Mt. Philo, determined many years ago, was discovered, and a new position for this mountain ascertained. In New Jersey, in portions of Burlington, Trenton, and Mercer counties, the old State surveys have been revised by the addition of new roads and of all houses, thus bringing the condition of the topographic mapping of Burlington, Bordentown, Lambertville, and Princeton quadrangles up to date.

In Pennsylvania the field work has been prosecuted more industriously in the eastern portion of the State than heretofore. The important agricultural region about Coatsville, Phœnixville, and eastern Lancaster County has been mapped, as also an area just west of the Susquehanna River, between New Bloomfield and Millerstown in Perry and Juniata counties. The survey of the great upland region in Blair and Indiana counties has been continued, and that of the unmapped district about Pittsburg, covered by the Burgettstown, Carnegie, McKeesport, and Greensburg sheets. Primary triangulation for control of future topographic mapping has been extended into Juniata and Mifflin counties, as well as into Mercer and Crawford counties, in the northwestern part of the State.

In Delaware the Wilmington quadrangle has been mapped, and in Maryland the survey of the Eastern Shore has been completed. In addition, the Ellicott City quadrangle has been surveyed and mapped in detail, and control by primary traverse for mapping Montgomery County has been completed.

In West Virginia a large amount of topographic mapping was completed in the northwestern counties, chiefly in Tyler, West Union, Wood, Ritchie, and Taylor. This region is one of the greatest activity to be found anywhere in the country in the development of the coal, oil, and natural gas resources, all of which are here abundant. The results of the mapping will aid greatly in

the study of these economic resources by geologists, and will be of great service.

In Ohio a greater amount of topographic work has been in progress than elsewhere in the United States. About ten parties have been actively engaged—some upon the extension of primary control in the eastern and northern counties, some upon the running of precise levels, to determine basal elevations, and others upon the detail of topographic mapping. The last completed about fourteen quadrangles, including areas about such cities as Lima, Springfield, Dayton, and Tiffin. In this region a contour interval of 10 feet has been used, owing to the comparative flatness of the country, and some of the resulting topographic forms are highly interesting. In the southeastern portion of the State, along the breaks of the Ohio River, the country is highly eroded, is covered with a rather heavy growth of wood, and has been found exceedingly difficult and expensive to map. In the areas surveyed in the northeastern portion of the State, in Ashtabula County in particular, many interesting facts have been developed concerning the form and position of the old lake shores.

In Kentucky quite an area of country has been mapped south and west of Owensboro, as well as a portion of the celebrated Blue Grass country in the neighbourhood of the capital, Frankfort, and of Versailles and Lawrenceburg. This is one of the most attractive pastoral regions in the United States, and has been found most agreeable to survey, both from the simplicity of the topographic forms and the delightful surroundings.

A work which will be of great economic importance, when followed by the geologic studies, has been the mapping on a large scale, and with great detail, of the important industrial region about Birmingham and Bessemer, Alabama. Previously a preliminary map had been made upon the scale of 2 miles to 1 inch, and with contours of 100-feet interval. The mapping just completed has been done on a scale of nearly 3 inches to the mile, near the cities of Birmingham and Bessemer, and throughout the country surrounding them on a scale of 1 mile to one inch, with contours of 20-feet interval. The result has been to show the detail and characteristics of the forms and the great amount of culture resulting from the mining settlements.

The survey of the region north of Baton Rouge, La., covered by the Bayou Sara quadrangle, has been completed, as has also that of the Wilkes quadrangle, in the county of that name in Georgia. A careful re-survey has been completed in the region

covered by the Saluda quadrangle in the mountains of North and South Carolina, and some preliminary work looking to the future mapping of the important region about Charlotte, N. C., has been undertaken. On the coast the Hertford quadrangle, on the Albemarle Sound, has been completed, and two areas of great historic importance in tide-water Virginia, covering the region about Yorktown, Jamestown, and Williamsburg, have been mapped. This work will be of great interest in connection with the proposed Jamestown Exposition.

In Wisconsin quite an area of mapping has been completed, in much detail, about the capital city of Madison, and in the neighbourhood of Evansville, and the revision preliminary to a careful study of glacial action in southern Wisconsin has been made of the old Geneva and Silver Lake quadrangles. In North Dakota, Windemere quadrangle, covering the area between that city and Hankinson, has been completed. In Arkansas the country about Harrison, in the northern part of the State, has been mapped.

Another area of great economic importance, and one which will prove of much interest to mining engineers and economic geologists is the region covered by the Farmington and Potosi quadrangle in Missouri, the mapping of which has just been completed. In addition to the lead interests of this region a large amount of baryte is mined. The country is highly eroded, yet densely covered with a scrub growth of timber, which has rendered the work of the surveyors most difficult. W.

GEOGRAPHICAL RECORD.

AFRICA.

STUDYING THE CONGO NATIVES.—The *Bulletin* of the Royal Belgian Geographical Society has begun the publication of a series of ethnographical studies of the native population of the Congo Free State. The work has been incited by the fact that there is every prospect of considerable transformation in the customs of the natives through contact with the white races, and it is desired to record their ways of life and traditions while the opportunity still presents itself. The opening paper (Nos. 3 and 4, 1904), by Dr. Védy, deals with the A-Babuas, who live in the forested region which has the Welle River for its northern and the Bomokandi for its eastern border—a people of fine physique, who live on the

products of the chase and fisheries, and to some extent on human flesh, together with a few fruits of the plantations which they make by clearing away the timber. Their rivers are especially rich in fish, their land is very fertile, and these advantages have attracted the attention of the Arabs and native tribes to the north of them, who have not been able, however, to take possession of the country, as the dense forest makes it a difficult region to enter, and the A-Babaas, though not numerous, stoutly defend their home.

An Archæological Journey to the Siva Oasis.—Prof. Dr. George Steindorff describes (*Pet. Mitt.*, Vol. 50, No. 8) the journey which he, with Baron von Grunau, made from Cairo through the Libyan desert to the small Siva oasis and back, in Nov., 1899–Jan., 1900. The purpose was to make archæological researches in this oasis, famous in ancient times for the shrine of the Oracle of Jupiter Ammon, which was visited by Alexander the Great, Hannibal, Cato the Younger, and other distinguished men. The explorers remained in the oasis and its neighbourhood only 21 days. Most earlier white visitors had been inhospitably received, but these gentlemen were courteously treated by the influential sheik and the people, who, however, did nothing to forward the scientific purpose of the expedition; and as few labourers could be hired to make excavations, most of the proposed work was left undone.

The oasis was more extensive in ancient times, but in the course of centuries some sources of water have been exhausted, and the area of vegetation has diminished. Dr. Steindorff found at the village of Aghurmi, one of the chief centres of population, a temple still well preserved, which he believes, from its inscriptions and Egyptian reliefs, to have been built by a King of Egypt about four centuries before the Christian era. He adds that there can scarcely be any doubt, from a comparison of the classical sketches of the Oracle-Temple of Jupiter Ammon, with the position and appearance of Aghurmi crowning the top of a small mountain, that this is the holy city in which Alexander the Great was greeted by the priests as the Son of God. The inhabitants, of yellow, North African, Berber stock, are easily distinguishable from the Arab Bedouins and the negroes. The men speak both their Berber dialect and Arabic, particularly with the Bedouins, whose caravans come to Siva both from the east and west. An extended description of the journey and of its archæological results will be printed later.

The Cape to Cairo Railroad.—The London *Times* (weekly, Oct. 14) says that engineers are hard at work at the cantilever

bridge which is to span the Zambezi River at Victoria Falls. The bridge work is ready, and is being shipped to the Zambezi in sections. Sir Charles Metcalfe, who is superintending the extension of the railroad northward through Barotse Land, says that inducements are being offered to colonists to settle in the country now tapped by the completed part of the line. Land is being surveyed which will be given out in free grants of 160 acres each to *bona fide* settlers. Plots are being reserved along the line between Bulawayo and Salisbury. No piece of land will be more than three miles from the railroad. This scheme will be carried out up to the Zambezi and beyond it as the railroad progresses. Major A. St. H. Gibbons says there are large areas adapted for white settlement on the plateau of Barotse Land, through which the railroad is to be built.

Colonial Work in German East Africa.—Mr. Franz Eiffé says, in the *Deutsch-Ostafrikanische Zeitung* (July, 1904), that the development along the Tanga railroad leading up into the mountain region behind the coast is remarkable. The small planters are succeeding, and their cocoa palms, rice, maize, and cotton fields are in a very promising condition. The colonists are raising the larger part of the food they need. Their success with rice and maize has been phenomenal, and when the rich lands a little farther inland have railroad transportation there will be a surplus of food for export. On the other hand, the large planters who invested heavily in coffee and tobacco fields, without the necessary experience, are losers, and their plantations are not paying the interest on the money spent on them. The Biological and Agricultural Institute at Amani is experimenting with all kinds of plants, soils, and fertilizers, studying harmful plants, insects, etc., and distributing information, and especially the results of experience, that may be helpful to the colonists.

AMERICA.

The Rubber Districts of Eastern Bolivia.—Captain L. Jerrmann has an interesting description in *Petermanns Mitteilungen* (Vol. 50, No. 8) of his journey to the rubber district in the little-known region of eastern Bolivia to the south of the Guaporé River. This region is thinly peopled and seldom visited, and cartographers treat it in a very cursory manner or leave it white on the maps. Captain Jerrmann visited the only Bolivian port, Puerto Suarez, on a shallow offset of the Paraguay River. European and other foreign goods are brought by steamboat from Buenos Aires to Corumbá, Brazil, and forwarded in small boats to Puerto Suarez,

about 10 miles west, whence they are carted over 400 miles west to Santa Cruz, on the upper waters of the Piray affluent of the Rio Grande. This wagon road, like some others in Bolivia, is built better and kept in better condition than most of the common roads of South America.

The rubber district, which is south and west of the Guaporé River, is scattered in comparatively small areas through the dense forest. The tree is the *Hevea Braziliensis*, the same plant that yields Pará rubber along the Amazon. The methods of collecting and treating the crude rubber are the same as those used in the Pará trade.

ASIA.

Effects of Foreign Commerce in Japan.—Mr. Yukimasa Hattori, in his monograph on "The Foreign Commerce of Japan since the Restoration, 1869–1900" (Johns Hopkins Univ. Studies. Series XXII, Nos. 9–10), says that the growth of foreign commerce has had vast effect on every phase of political, social, and individual life in Japan. Foreign trade has increased the varieties of goods, improved the quality, and cheapened prices. Before rice was imported a sudden rise or fall in its price, which occurred with every change in the season's prospects, was greatly to the detriment of the labouring classes. Importations of foreign rice are now a regulator of prices. There is no longer fear of rice famines. Among the new commodities that foreign trade has brought are spices from India, sugar from Hongkong and the Philippines, coffee from South America, and the fruit, wine, and metals of many countries.

EUROPE.

Three Railroads across the Pyrenees.—Railroad connections between France and Spain are now limited to two lines which skirt the shores of the Bay of Biscay and the Mediterranean, passing around the extreme ends of the mountains. The *Geographische Zeitschrift* (No. 9, 1904) says that an agreement between the French and Spanish Governments has been signed in Paris under which it is stipulated that they shall jointly extend three railroad lines across the Pyrenees within ten years. The most westward line, starting from Oloron, in France, will cross the mountains over the Canfranc Pass to Jaca, in Spain; the middle route will join St. Girons with Lerida over the Salau Pass; the eastern line will unite the town of Aix-les-Thermes with Ripoll over the Puigcerda. It is said that the time of the journey between Toulouse and Barcelona

will be shortened by three hours by the building of one of these roads. Work will be simultaneously in progress on all the lines. The agreement will not be in effect until it is ratified by the Parliaments of both States.

THE LILLE GEOGRAPHICAL SOCIETY.—This Society, founded in 1880, has 2,248 members, including its sections in the neighbouring towns of Roubaix and Tourcoing. This is a large number in proportion to the population from which the membership is drawn. Various expedients are adopted to make the Society useful to the members. Excursions under the management of the Society have become very popular. Last year's programme comprised twenty-three excursions, some of them extending into Spain, Holland, Switzerland, and the Vosges. Over 900 members took part in these instructive journeys, which involved only moderate expense. The Society also stimulates local interest in geographical study by lecture courses and by offering prizes to students in the public schools for the best descriptions of geographical areas selected for their study. The monthly *Bulletin* is filled with information, and the energetic measures taken to add to the Society's influence and membership appear to be meeting with noteworthy success.

DEVELOPMENT AND POSITION OF MAP-MAKING IN EUROPE OUTSIDE OF GERMANY.—Captain W. Stavenhagen, an authority on topography in the military service of Germany, has prepared a "Skizze der Entwickelung und des Standes des Kartenwesens der ausserdeutschen Europas." It appears as Ergänzungsheft No. 148 to *Petermanns Mitteilungen* (Justus Perthes, Gotha). The task that the author assumed covers a very large field, and has involved enormous labour. Although he excludes the cartography of the German Empire from the present volume, desiring to give it separate treatment, the influence of the great German map-makers upon the cartographic development of most of the other nations of Europe has been so important that he necessarily makes many allusions to them.

In the introductory chapter he discusses the influence of cartography upon geographic study, and describes the broad groups into which maps may be divided—(1) Geographic or general maps, which are rarely compiled from original sources, but are reduced from maps of larger scale; and (2) topographic or special maps on a comparatively large scale, reduced from original surveys. In these two large groups the author finds a considerable number of subdivisions, and describes the classes of maps in each of these departments.

He then sketches the history of cartographic development in Europe as a whole, and appends a list of the most important maps and atlases of the present day relating to Europe, including the work of Governments and private publishers. The list might well have been extended to include a few more of the best specimens of British atlas-making.

The ancient, middle, and modern periods of map-making in each country are then described, with their most conspicuous products; and a summary view is given of the part taken by each map-making nation in the history of cartography. The reader is informed of the kind of maps each nation produces, of their styles of production, and something of their cartographic peculiarities. Some idea is given as to the clearness, accuracy, good taste, and price of many of these products. The volume includes a bibliography of the literature relating to cartography in all European countries.

This work, of 376 large pages, covers a field of great importance, which in its whole compass has not in recent times been adequately investigated. It is, therefore, a most timely and valuable addition to our means of studying the history and the outcome of cartography. It is to be hoped that Captain Stavenhagen will extend his studies to all the other map-producing parts of the world, according to his original plan.

POLAR.

ELLESMERE LAND.—The land-mass separated from Greenland by Smith Sound, Kane Basin, and Kennedy and Robeson Channels, having been proved by Peary and Sverdrup to be one island instead of two or more, is to bear the name Ellesmere Land, if the decision of the Geographic Board of Canada prevails. Different parts of this land (from S. to N.) have to this time borne the names North Lincoln, Ellesmere Land, Grinnell Land, and Grant Land. In naming the whole Ellesmere Land the Canadian Board acts upon the idea that British sovereignty extends over the entire Arctic archipelago north of our continent. Whether or not the suggested name is approved, the names Grinnell Land and Grant Land, given by United States explorers, will doubtless be retained to designate the northern parts of the island.

GENERAL.

BIBLIOGRAPHIE GÉOGRAPHIQUE ANNUELLE OF THE ANNALES DE GÉOGRAPHIE.—The thirteenth volume of this very useful publication covers the chief features of the geographical literature of 1903. It includes 997 items, many relating to books and many others to

articles and maps in the geographical periodicals. The paragraphs under each title, written by one or another of the 54 geographical specialists who assisted Professor Louis Raveneau in the preparation of the volume, are often illuminative as to the purpose, the essence, and achievement of the works under review. The contents are arranged by authors alphabetically under general and sub-heads, making it very easy to turn to any particular work and the department of geography in which each is treated. The annual appearance of this work is always awaited with interest, because it is not only a most adequate and useful record of a year's geographical literature, but a critical summary of the literary output which it records and classifies. The *Bibliographie* has now adopted the system of abbreviations employed in the *Bibliotheca Geographica*. The diversity of abbreviations used to designate a large number of geographical publications is disappearing; and this is desirable, as it has been a source of considerable confusion.

Mr. Bailey Willis's Return from Asia.—Mr. Bailey Willis, of the U. S. Geological Survey, who in 1903 received a grant from the Carnegie Institute for geological explorations in eastern China, has recently returned home. His mission was to carry on a comparative study of the geology of eastern Asia and western North America by observations in stratigraphy, structure, and physiography in eastern China and Siberia, and by the collection of fossils, particularly with reference to the development of the Cambrian faunas.

Distribution of the Cinchona Tree.—Mr. J. Dronke, in his monograph on the transplanting of this plant from its native home in South America to Asia, gives some interesting facts concerning its present distribution. The habitat of the cinchona is between 10° N. and 22° S. latitude in the Andes and among the coastal mountains of Venezuela and Colombia. The upper limits of its range are, according to the species of the tree, from 800 to 3,000 metres. The first attempt to transplant it was in 1850, when it was taken to Algeria, with poor success. In 1854, Mr. Hasskarl, for the Dutch Government, introduced young trees and seeds into western Java. It was found to thrive finely in well-watered regions between 1,500 and 1,700 metres above the sea, and with an average temperature of about 17° (62° Fahr.). When it was discovered that *Cinchona Calisayæ var. Ledgeriana* supplied the most valuable medicinal product the cultivation was confined to this species.

The cinchona industry rapidly developed in Java, and that island

now far surpasses all other lands in the quantity of quinine produced. Eighty per cent. of the world's product comes from Java, and the plantations cover 20,000 acres. The tree was introduced into southern India in 1861; but though it thrives there it has in recent years been neglected, on account of the decreased price of cinchona bark, so that in 1899 the plantations covered only about 5,000 acres. It was taken into northern India along the southern slopes of the Himalayas, and in Sikkim, but its cultivation there has not been important. The production of cinchona bark in Ceylon steadily grew for twenty years after its introduction in 1861. In 1881 the island was one of the greatest sources of supply. In the following ten years, however, the production greatly declined, and fell from over 15,000,000 to 510,462 pounds. Other attempts to introduce the plant into Asia, Africa, and Australia have not met with success. Recent experiments with the cinchona tree in German East Africa have been discontinued.

ECONOMIC GEOGRAPHY NOTES.

GERMAN TRADE WITH SPAIN.—The German Consul at Barcelona recently published in the *Deutsche Industrie-Zeitung* a report showing an improvement in Spain's commercial position, and also illustrating a pretty phase of international commercial relations. Germany is selling large quantities of partly-finished goods, raw materials, and machinery to Spain. Spain completes the manufacture and sells the goods to Latin America. Spain's trade with the latter is increasing, which growth reacts on Germany, increasing her trade with Spain. Another possible result in the reaction, however, is not noted. As Spain's sales to the Western countries increase, Germany's to the same countries may decrease.

The same Consul is quoted in the U. S. Consular Report for August concerning Spain's economic condition. Recovery from the effects of the Spanish-American war was aided by the stimulated markets in her lost but better-governed colonies, and by the return of many capitalists to Spain, thus giving a new impetus to trade and internal enterprise. The loss of her colonies induced her to attend to home improvement and study her colonial and international relations.

Our Department of Commerce and Labor Report for 1903, and the Bureau of Foreign Commerce for previous years, give the following figures for Spain's total foreign commerce: In 1901, 335 million dollars; in 1902, 342 millions, and in 1903, 338 millions, which shows very little change; but the truth is better told by

comparing the exports and imports. In 1901 the excess of imports over exports was 29½ millions, in 1902 it was 13½ millions, and in 1903 they were still more closely balanced. Really, then, what is happening is an actual decrease in Spain's imports and an increase in her exports. Agriculture and mining must remain her chief occupations, and the revival in both fields is accountable for the above facts. G. D. H.

MACHINES FOR THE TROPICS.—One of the ways in which industry responds to geographic conditions is in the adaptation of its machines. Wheat harvesters in Southern California, Dakota, and Northern Illinois vary greatly. But when a whole zone of latitude intervenes between two regions the variance is even more marked, because the agricultural products are essentially all different. According to U. S. Consul Langer, in his report for August, 1904, Germany is putting forth great effort in the devising and making of machines for cultivating, harvesting, and preparing for export the crops of tropical countries. Among those which her ingenuity has designed are a machine for splitting cocoanuts, to get the meat for copra; one for preparing the palm fruit and for extracting the oil, and one for manufacturing caoutchouc from the sap of the rubber tree. Germany is also credited with several devices for tropical railroads, harbours, draining plants, cultivators, and with methods for building houses adapted to the tropics.

G. D. H.

FISHERIES OF JAPAN.—H. M. Smith, of the U. S. Bureau of Fisheries, has prepared an article on the above subject, which appears in the September number of the *National Geographic Magazine*, and which brings out many interesting facts concerning the geographic relations of this great industry. He says Japan is the leading fishing nation to-day, although the value of her sea products is surpassed by that of two other countries. The United States, outside of Alaska, and Great Britain each produce about $45,000,000 worth annually, and Japan produces about $30,000,000 worth. Japan leads in the proportion of the total population engaged in the fishing industry, in the actual number of people living by the industry, in the relative importance of fish products in the country's domestic economy, in the skill and ingenuity of the people in making appliances for fishing and for preparing the products, in the extent to which all water products are utilized, and in the support given by the Government to the industry. Geographic factors potent in the development of the fisheries are: Abundance of most

useful sea products; great extent of the empire both in latitude and longitude, giving wonderful variety of water life; the island nature of the country and the length of the coast-line, and consequently the ease with which all can come under the influence of the sea and almost all receive, daily, fresh fish at their doors; certain national characteristics of the people, probably, in part, results of the influence of their environment; and, lastly, Government recognition of the importance of the industry shown by the steps taken to promote and protect the fisheries.

The principal differences between the fisheries of the United States and those of Japan are in the relative amount of the different species in the total output. Her chief fishes, in the order of importance, are herring, sardines, bonito, redsnapper, mackerel, and squid and cuttlefish. According to an article in the same magazine last May from a member of our Bureau of Fisheries, our chief fishes were salmon, shellfish, cod, herring, lake herring, and alewives.

One other important feature in the development of Japan's fisheries is the Imperial Fisheries Institute on Tokio Bay—a school for instruction in fishing, fish culture, and fisheries technology.

G. D. H.

THE ECONOMIC VALUE OF THE U. S. TOPOGRAPHIC MAPS.—The U. S. Geological Survey has recently published a small memorial volume telling of its work and growth during its just-completed first quarter-century. Among other things it points out some of the economic uses to which the topographic maps made by the Survey have been put. Of course, they are the bases for the various other branches of the Survey, and also for several other divisions and bureaux of the Federal scientific work; but they have been of inestimable value in other lines. They have greatly aided railway companies and highway bureaux in locating and building roads. This is especially marked in New York, Massachusetts, and Maryland. They have aided in investigations by cities for water and by canal companies for location, development, and improvement of artificial waterways. They have been of great value to irrigation and manufacturing companies in locating streams and reservoirs and in studying catchment basins and fall. They have been extensively used in opening up and expanding mineral workings, and in many engineering projects besides these mentioned; and last, but probably not least, through their use in the schools, they have been of great educational value. This last point means that there will be a larger, more intelligent use of the maps in the coming generation.

G. D. H.

FORESTS AND RAINFALL IN THE HAWAIIAN ISLANDS.—The question of the influence of forests upon rainfall is one which has long been of great interest, and any information upon the subject is always welcome. In Bulletin No. 48, Bureau of Forestry, *The Forests of the Hawaiian Islands*, by W. L. Hall, there are several notes on the climatic controls of the Hawaiian forests, and the relation of these forests to rainfall and water supply. There are two distinct kinds of forest in the islands—one occurring near sea-level, in the drier parts, and the other on the mountain slopes, where the rainfall is heavy. The former consists of a single species (*Prosopis Juliflora*), the mesquite of the southwestern United States, and introduced from that country. On Oahu, this forest extends in a narrow, almost continuous, belt along the south and west coasts, where it is protected from the northeast trade-winds, exposure to which it cannot endure, and on the other islands it occupies a similar position, reaching up the dry slopes to an altitude of several hundred feet. The trees of these forests furnish good wood for fuel; the pods are a valuable food for stock, and the trees have tremendous powers of reproduction. Hence they will inevitably be cared for by individuals, without any action on the part of the Government. While there are no records to support the opinion, Mr. Hall says that it is believed by some that the districts covered by these forests receive more local showers than formerly.

The second group of forests—the native trees—are distinctively of tropical character, and the best always occur where the rainfall is heaviest. The undergrowth is abundant; there is a great quantity of humus, and even in dry times enough water may be squeezed from a few handfuls of moss to give a good drink. The heaviest native forests are found on the windward mountain slopes, saturated by frequent rains during the greater part of the year, at elevations of 1,500 to 3,000 feet. The forests become thinner and poorer toward regions of lessened exposure to the trade-winds and decreased rainfall, and on leeward slopes, where the rainfall is in places less than 30 to 40 inches a year, there was originally no forest at all. The timber-line is 6,000–8,000 feet; the trees, being representatives of the torrid zone, find their limit at a comparatively low altitude in these islands, which lie at the edge of the tropics.

At present the crucial forest question on the Island of Hawaii is the wisdom of the removal of the native forests, where land is being cleared for the extension of cane fields up the slopes of the mountains, the danger being that as the trees are removed to give

place to the cane the water supply may be so seriously diminished as to make profitable sugar-cane-growing impossible. In this connection attention may be called to a statement (p. 22) concerning the effect of the trees in collecting the moisture already present in the atmosphere as cloud. A case very like this was described by Professor Abbe some years ago in the Island of Ascension, where the trees on Green Mountain collect the cloud particles, causing a steady drip to the ground, and thus furnishing a part of the water supply for the inhabitants at lower levels. Along similar lines come the suggestions which have been made regarding the collection of fog particles on the coast of California by means of mechanical contrivances built of wire, and so arranged that the drops collected on the wires shall be conducted to the roots of trees:

Throughout the Hawaiian Islands, but especially in these two districts (named below), the influence of the forest upon the amount and distribution of rainfall is a matter of common observation and experience. Back of the sugar plantations in Kohala and most of Hama Kua the land does not rise above an elevation of 3,000 feet, and, therefore, lacks the heavy rainfall which results from higher elevations. As the forests have occupied the land above the plantations, they, to a certain extent, have answered the purpose of the mountains in cooling the atmosphere and causing the saturated trade-winds to relinquish their moisture over the plantations. The evidence of this influence is convincing, and seems capable of demonstration, to some extent, by measurement. On the plains of Hama Kua and the lower northeast slope of Mauna Kea, where heavy fogs blow over from the ocean, and mists are of almost daily occurrence, the top of a single tree condenses enough moisture to make the ground beneath it muddy, or even to cause water to stand, while beyond the influence of the tree top the surface of the ground may be entirely dry. At Punohu, where the Parker ranch maintains a dairy, there is a short row of vigorous eucalypts about 100 feet high. These trees condense so much water that the ground beneath them is always muddy. The ranch has taken advantage of this unusual circumstance by placing beneath the tree tops a roof of sheet iron, which collects the water and runs it into a gutter, which leads it into a tank. The water thus collected is sufficient for a large number of stock.

It may here be noted, editorially, that the question whether trees really answer "the purpose of the mountains in cooling the atmosphere" may be considered an open one, although it is certain that trees can collect water particles already present in the air as fog or clouds. There can be no question that the reduction of the forest areas can easily cause a diminution of the flow of water for fluming, but that it has "decreased and made irregular the rainfall," the majority of those who have made a careful study of forest meteorology, although on the whole doubtless prejudiced in favour of the view, would probably hesitate to believe at once without the support of instrumental records. No one, however, will

deny that the forests which lie above the cane fields on the mountain slopes "possess so great a relative power that they distribute very evenly" a "tremendous quantity of water," nor that reckless deforestation will probably "make the water conditions so precarious as to reduce greatly the productiveness of the plantation, if not to ruin them entirely." R. DEC. W.

NEW GUINEA NATIVES WHO CAN SCARCELY WALK.

The *Report* on British New Guinea for the year ending June 30, 1903, gives a brief account of the visit of Sir Francis P. Winter, Acting Administrator of the colony, to the Eastern Division. He improved this opportunity to enter a locality occupied by a small tribe called the Agaiambo, who are regarded with curiosity by their neighbours, owing to their preference for living in a series of swamps or shallow lakes, not far from the lower waters of the Barigi River. This tribe illustrates in a striking manner the influence of its environment upon physique. As they seldom venture upon dry land, but live in their huts and boats, the men have become almost incapacitated for walking. Here is what Sir Francis Winter says of them:

Emerging from the forest, we came out on a flat covered with reeds and rank grass, and after walking a couple of hundred yards through this, we arrived at the margin of an extensive sheet of shallow water, in which water lilies and other aquatic plants that do not rise above the surface of the water were growing. On the other side of this mere, and close to a bed of reed and flags, was a little village of the small Agaiambo tribe, and about three-quarters of a mile off was a second village. After much shouting our Barugi followers induced two men and a woman to come across to us from the nearer village. Each came in a small canoe, which, standing up in, they propelled with a long pole. One man and the woman ventured on shore to where we were standing.

The Agaiambo have, for a period that extends back beyond native tradition, lived in this swamp. At one time they were fairly numerous, but a few years ago some epidemic reduced them to about forty. They never leave their morass, and the Barugi assured us that they were not able to walk properly on hard ground, and that their feet soon bleed if they try to do so.

The man who came on shore was middle-aged. He would have been a fair-sized native, if his body from his hips downward had been proportionate to the upper part of his frame. He had a good chest and a thick neck, and his arms matched his trunk. His buttocks and thighs were disproportionately small, and his legs still more so. His feet were short and broad, and were very thin and flat, with weak-looking toes. This last feature was still more noticeable in the woman, whose toes were long and slight, and stood out rigidly from the foot, as though they possessed no joints. The feet of both the man and woman seemed to rest on the ground something as wooden feet would do.

The skin above the knees of the man was in loose folds, and the sinews and muscles

around the knees were not well developed. The muscles of the shin were much better developed than those of the calf. In the ordinary native the skin of the loins is smooth and tight, and the anatomy of the back is clearly discernible, but the Agaiambo man had several folds of thick skin or muscle across the loins, which concealed the outline of his frame.

On placing one of our natives, of the same height, alongside the marsh man, we noticed that our native was about three inches higher at the hips. I had a good view of our visitor while he was standing sideways towards me, and in figure and carriage he looked to me more ape-like than any human being I have seen. The woman, who was of middle age, was much more slightly formed than the man, but her legs were short and slender in proportion to her figure, which, from the waist to the knees, was clothed in a wrapper of native cloth.

The houses of the near village were built on piles at a height of about twelve feet from the surface of the water, but one house at the far village must have been three or four feet more elevated. Their canoes, which are small, long, and narrow, and have no outrigger, are hollowed out to a mere shell to give them buoyancy. Although the open water was several feet deep, it was so full of aquatic plants that a craft of any width, or drawing more than a few inches, would make but slow progress through it. Needless to say that these boats, which retain the round form of the log, are exceedingly unstable; but their owners stand up in them and pole them along without any difficulty.

These people are very expert swimmers, and can glide through beds of reeds or rushes, or over masses of floating vegetable matter, with ease. They live on wild fowl, fish, sago, and marsh plants; and on vegetables, procured from the Barugi in exchange for fish and sago. They keep a few pigs on platforms built underneath or alongside their houses. The dead they place on small platforms among the reeds, and cover the corpse over with a roof of rude matting. Their dialect is the same as that of the Barugi. Probably their ancestors at one time lived close to the swamp to escape from their enemies, and were driven to seek a permanent refuge in it.

After a very dramatic harangue from Oyogoba, one of the Barugi, our Agaiambo friend promised that on the following morning his people would bring some of their largest canoes, locked together in twos, to enable us to travel about in the swamp. Mr. Monckton had visited them once before, and on that occasion they had done this for him. But either after we had left, or very early next morning, one of our native followers had, so our interpreter told us, demanded from the Agaiambo a pig in our name. At all events they became alarmed and retreated to the further village, and we were not able to again get into communication with them. We, therefore, broke up camp and went back to the river.

Captain Barton, in his report on the Central Division of the Colony, says he believes the tribes there are rapidly dying out. Some communities have decreased by more than one-half within the past ten years; others are declining less rapidly. He attributes this decrease in population to intermarriage, and the introduction of new diseases. The tribes owning the richest land and otherwise best off seem to be declining most rapidly. The village of Banuapaka, in the Kabadi district, for example, contained ten years ago over 1,000 inhabitants, but to-day there are only 350. He found that 22 per cent. of the children in the school were born cripples. The inhabitants in this village never marry women from other villages, and do not hesitate to marry their own relatives. In spite of the educational work among the tribes there seems to be no progress towards practical civilization. The government has practically brought tribal warfare to an end without producing as yet an increase in population. Superstition and belief in the efficiency of sorcery are as rife as ever.

GOLD MEDAL OF THE PARIS GEOGRAPHICAL SOCIETY PRESENTED TO COMMANDER PEARY.

His Next Arctic Ship.

A very interesting incident marked the dinner complimentary to the foreign members of the Eighth International Geographic Congress given by the American Geographical Society in New York on the evening of Sept. 14. It was the presentation to Commander Peary of a Gold Medal of the Paris Geographical Society in recognition of his long and fruitful labours in the field of Arctic exploration. The medal was brought to this country by Prof. Henri Cordier, President of the Paris Society, who, in a felicitous speech, spoke of the many and valuable contributions to Arctic discovery that Commander Peary had made.

The distinction which the Paris Geographical Society had conferred upon him was eloquently acknowledged by the explorer, who requested Prof. Cordier to convey to the Society his thanks for the great honour.

Commander Peary happily chose the occasion of this presentation to announce to the Congress that he had just signed a contract for the building of the ship which will take his expedition to Greenland next summer for the renewal of his attempt to reach the North Pole. He said of this vessel:

She will, I believe, be the ablest ship that ever pointed her nose inside the Arctic or Antarctic Circle. She will possess such shape as will enable her to rise to the pressure of the ice-floes and escape destruction. She will possess such strength of construction as will permit her to stand this pressure without injury. She will possess such features of bow as will enable her to smash ice in her path, and will contain such engine power as will enable her to force her way through the ice. In maximum dimensions—viz., length over all, breadth of beam and draught—this ship will be of the size of the British Antarctic ship Discovery; in displacement she will be somewhat less; in power she will compare with our largest ocean-going tugs.

My plan of campaign, in a very few words, is to force this ship to the north shores of Grant Land, taking on board at Whale Sound the pick and flower of the Eskimo tribe with whom I have worked and lived so long; to go into winter quarters on that shore, and to start with the earliest returning light on the sledge journey across the central polar pack, utilizing these Eskimos—the people whose heritage is life and work in that very region—entirely for the rank and file of my party.

Never before has it been in the power of a white man to command the utmost efforts and fullest resources of this little tribe of people as I can do, and that fact will be of inestimable advantage to me.

But I will not take time with details. Next summer I shall start North again after that on which I have set my heart.

Shall I win? God knows. I hope and dream and pray that I may. But if I do not some one else will; and here comes in another feature of polar efforts.

There is no higher, purer field of rivalry than this Arctic and Antarctic quest.

If I win, you will have another one of these magnificent tokens for me, and be proud because we are of one blood—the man blood. If I fail, you will try it until some one gets there, and then we shall have one of these for the man who wins, whether he bears the colors of France or England or Germany or Norway or Italy, and shall be proud of him, for we shall know he is a man and come of a nation of men, and that the best man has won.

The hull of the new ship is being built at the shipyard of McKay & Dix, Verona, Me., and the utmost dispatch consistent with thoroughness is being used to turn the boat out by the early spring. The hull will cost about $75,000, and the engines, which are being constructed by the Portland Company, will cost about $45,000. The new ship is not large, but is of ample size for the work cut out for her. Her principal dimensions are: Length over all, 181 feet; maximum beam, 32 feet; mean draft, 16 feet; full load displacement, about 1,500 tons. The vessel will be massive in structure, with stem, sternpost, keel and frames of selected white oak, so framed as to withstand very heavy pressures, and so shaped as to have a tendency to lift out of the water as the ice presses against her sides. There will be two deck-houses, and the vessel will be heated by steam and lighted both by electricity and oil lamps. She will have a sufficient spread of canvas to make her manageable under sail alone.

NEW MAPS.

AMERICA.

ALASKA.—U. S. Signal Corps Telegraph and Cable System in Alaska and U. S. Cables and Canadian Line connecting with the United States. Scale; 1:6,000,000, or 94.6 statute miles to an inch. Prepared under the direction of Brig.-Gen. A. W. Greely, Chief Signal Officer U. S. A. War Department, Washington, D. C., 1904.

The United States cable and land lines are shown in red and the Canadian lines in black. Settlements in Alaska are distinguished as merely towns or stations, telegraph offices, post offices, or post and telegraph offices. The cable from Seattle to Sitka is 1,070 miles long; that from Sitka to Juneau and up Lynn Canal to Skagway, 413 miles; that from Sitka to Valdes, 596 miles, making a total of 2,079 miles of cable. A wireless section, in uninterrupted operation for nearly four months, extends from St. Michael across Norton Sound, 107 miles, to Safety Harbor, giving telegraph facilities to Nome, twenty-four miles westward. The land-lines extend from Valdes to Eagle City on the Yukon, with a branch down the Tanana and Yukon Rivers to St. Michael. The total length of land-lines is 1,254 miles, and of cable, telegraph, and wireless 3,440 miles, with 47 cable and telegraph stations.

UNITED STATES.—Stratigraphic and paleontologic map of Canandaigua and Naples Quadrangles, New York. Scale, 1:62,500, or 0.9 statute miles to an inch. By John M. Clarke, State Paleontologist, and D. Dana Luther, Field Assistant. University of the State of New York, Albany, 1904.

The map presents a considerable diversity of colour, to show minute distinctions in sedimentation. It illustrates *Bulletin* 63 of the New York State Museum, in which is described the succession of fossil faunas that are found in the rock formations as shown on the map. Many local names are used to designate formations, and, as Dr. Clarke says, many of these names may serve only a local, and some of them, perhaps, only a temporary purpose.

CENTRAL AMERICA.—Karte von West-Salvador und von Süd- und West-Guatemala. Scale, 1:500,000, or 23.67 statute miles to an inch. By Karl Sapper. *Pet. Mitt.*, Vol. 50, No. 9. Justus Perthes, Gotha, 1904.

Eleven tints show areas of elevation from sea-level to over 4,000 metres above the sea; in addition, the heights of conspicuous mountains and of the majority of the towns are shown in metres. Most of the river courses are in broken lines, indicating that the surveys are not yet sufficiently detailed to establish the exact courses of the waterways. The map is based upon Dr. Sapper's surveys in 1889–1902 and the maps of Paschke, Rock, and the Inter-Continental Railway Commission.

SALVADOR.—Karte der Izalco Vulkane (Republik Salvador). Scale, 1:100,000, or 1.5 statute miles to an inch. Contour interval, 100 metres. By Karl Sapper. *Pet. Mitt.*, Vol. 50, No. 9. Justus Perthes, Gotha, 1904.

Gives Dr. Sapper's surveyed and unsurveyed routes, the periphery of crater rims, the position of fumaroles, lava flows, etc., and shows the location of the places fixed through triangulation by the Inter-Continental Railway Commission.

BOLIVIA.—Mapa de la República de Bolivia (4 sheets). Scale, 1:2,000,000, or 31.56 statute miles to an inch. By Engineer Franz Germann. L. Friederichsen & Co., Hamburg, 1904.

This map (Spanish nomenclature) is the best that has yet been produced of Bolivia as a whole. It came a little too early, however, to include the treaty changes in the northern and eastern boundaries of Bolivia (*vide* map in BULLETIN, April, 1904, p. 256); and though on a larger scale it has not so detailed a delineation of the greater portion of southeastern Bolivia as is found on the map of Captain L. Jerrmann (*Pet. Mitt.*, 1904, No. VIII). With these exceptions the map includes the results of Mr. Germann's ten years of study in the field, supplemented by many other important sources of information. The vast spaces still white to the east and north of the mountain complex in the west show that the larger part of the country is still very little known. In the mountain region are approximate curves of level with intervals of 500 metres. While very helpful in studying the topography, they would be more useful if the elevations above sea-level of some of these contours or of the more important towns and mountains had been indicated in figures. The situation and nature of all the mineral industries, the railroads in operation and projected, the telegraphs, salines, and much other information are clearly indicated.

TITICACA.—Carte Bathymétrique du Lac Titicaca. Scale, 1:525,000, or 8.28 statute miles to an inch. By Dr. Neveu-Lemaire. *La Géographie*, Vol. IX, No. 6. Paris, 1904.

Four tints show the contours of the lake bed, the lightest representing depths up to 25 metres and the darkest depths of over 200 metres. The positions and figures of 160 soundings by Dr. Neveu-Lemaire and of 115 by Raimondi are shown. The

southern part of the lake, or Little Lake, is very much shallower than the main lake. The greatest depth found was 272 metres in the north central part.

AFRICA.

BORGU.—Cercle du Borgou. Scale, 1:500,000, or 7.8 statute miles to an inch. By Georges Brousseau. *La Géographie*, Vol. X, No. 3, Paris, 1904.

Borgu is a district, for the most part densely populated, lying between the middle Niger and Togo. This black map, based chiefly upon the itineraries of eleven French explorers (1894–1904), shows a large number of native routes, with towns and villages, and is similar to the maps the French are now producing in many parts of their Sudanese possessions.

MOROCCO.—Morocco. Scale, 1:1,000,000, or 15.7 statute miles to an inch, with seventeen insets, showing the most important towns and their environment on larger scales. By R. de Flotte de Roquevaire. Henry Barrère, Paris, 1903.

With five-sixths of Morocco still closed to Christians, who can enter only in disguise or on peril of their lives, a satisfactory map of the country is still impossible. The merit of this map is that it is a careful compilation of the best data obtainable up to this time, and that the work is scientifically and technically carried out on an unusually large scale. It includes all the geographical discoveries made since this century came in, and the year 1901 marked the beginning of a new epoch in the progress of Moroccan exploration. Conspicuous among these explorers are Captain Larras, the Marquis de Segonzac, and Prof. Theobald Fischer, whose important results are shown on this map. The insets, on scales of 1:20,000 to 1:100,000, are large enough to show the town plans. The inset of the environs of Fez is entirely new. A pamphlet accompanies the map, giving the data upon which each part of the drawing is based and a complete bibliographical index to the sources used in constructing the map.

SIERRA LEONE-LIBERIA.—Map of the Sierra Leone-Liberian Boundary. Scale, 1:500,000, or 7.8 statute miles to an inch. Surveyed by the Anglo-Liberian Boundary Commission, 1903. *Geo. Jour.*, Oct., 1904.

The Anglo-Liberian Boundary Commission spent the first six months of 1903 in delimiting and marking their entire frontier. The boundary starts from the intersection of the Uldafu River with the 13th meridian west of Paris, and follows this meridian to its intersection with the left bank of the Mannah at low water, which then becomes the boundary to the coast. As a result of the work the mouth of the Mannah was placed two miles west of its previously-accepted position.

EUROPE, ASIA, AND POLAR.

GREAT BRITAIN.—Geographical Distribution of Vegetation in the Basins of the Rivers Eden, Tees, Tyne, and Wear. Part II. Scale, 1:63,360, or one statute mile to an inch. By Francis J. Lewis. *Geog. Jour.*, Sept., 1904.

The lower limit of the Alpine moorland follows the 2,000-feet contour very closely, but elsewhere the plant boundaries have no direct connection with the contour lines frequently running at right angles with them.

CHINA-TIBET.—Skizze der Route von Grueber und de Dorville von Peking nach Agra (1661–62). Scale, 1:20,000,000, or 315.6 statute miles to an inch. *Zeitschrift* of the Berlin Geographical Society, No, 5, 1904, Berlin.

Illustrates a paper on the celebrated journey of these Jesuit fathers across China and Tibet to Agra in India, visiting Lhasa on the way. The names which they mentioned in their reports are underscored. They were eleven months on the journey.

ANTARCTIC.—(1.) Entwicklung unserer kenntnis der Länder südlich von Amerika, 1873–1903. (2.) Victorialand nach den englischen Forschungen, 1902–4. *Pet. Mitt.* Vol. 50, No. 9. Justus Perthes, Gotha, 1904.

Four small Mercator maps show the South Shetland Archipelago, Graham and other lands south of South America as they are represented on the maps of Dallmann (1873–74), Larsen (1893), the *Belgica* (1898), and Nordenskjöld (1902–3). Larsen's map showed an important advance, as he was the first to see the east coast of Graham Land, and found that it extended much further to the east than it had hitherto been tentatively represented. The *Belgica* expedition very largely changed the nomenclature of this region, the propriety of so doing being still questioned. It made few other changes on Larsen's map. According to Larsen, Trinity Island and Palmer and Louis Philippe Lands were independent islands, but Nordenskjöld established the fact that Louis Philippe is the northern part of Graham Land, and is much smaller than Larsen represented it. Two areas shown on Larsen's map as a part of it are represented by Nordenskjöld to be islands—Ross and Snow Hill. King Oskar Land retires to the west on the later map, and in front of it lies a broad, level ice-field. Trinity Island is greatly reduced in size, and a considerable number of islands disappear. Thus Nordenskjöld has fundamentally changed the earlier maps in many respects.

The map of Victoria Land, on a scale of 1:7,500,000, or 118.3 statute miles to an inch, shows the ship route of the British expedition in the first year, and the sledge routes in the first and second years of the expedition's sojourn there.

THE WORLD.—Verbreitung des Deutschtums auf der Erde. (Mercator Projection.) *Deutsche Erde*, Vol. 3, No. 5, Justus Perthes, Gotha, 1904.

Five tints and white are used to show the percentage of German inhabitants in the total population. Routes of the German steamship lines and ocean cables are indicated. The map calls to mind the book written by Dr. Wilhelm Stricker, and published in 1845, on the distribution of the German race over the earth. A comparison of the information then presented with that given in this map shows not only the importance of German migrations in recent decades, but also the growth of geographical knowledge and of technical ability to give it cartographic expression.

HUNGARIAN ACTIVITY IN GEOGRAPHY.

The excellent specimens of the Cartography and other geographical products of Hungary which Dr. Béla Erödi, president of the Hungarian Geographical Society, has presented to the American Geographical Society (*Bulletin*, pp. 630–631, Oct., 1904), are not the least among the evidences of large activity in this field which Hungary is now exhibiting. In his recent address before the Eighth International Congress on "Geographical Science in Hungary" Dr. Béla Erödi said that only recently has Hungary displayed any considerable methodical activity in the field of geographical science; but now scientific and intellectual societies have been founded, and, hand in hand with the state, are making great

efforts to supply the deficiencies of the past and compete with other states, which, by reason of their more favourable position, have been able to do more for the science.

Side by side the Hungarian Academy of Sciences, the Hungarian Geographical, the Royal Natural Science, Ethnographical and Geological Societies, as well as the Carpathian Associations, with their many branches, are displaying lively activity in promoting scientific work and making the science of geography popular. Since the restoration of the constitutional state of affairs (in 1867), the Hungarian Government has not shrunk from making sacrifices in furthering the rapid progress of the sciences. The Crown Prince Rudolph set a good example by putting himself at the head of the movement, and, supported by a host of distinguished collaborators, started the mighty work entitled "The Austro-Hungarian Monarchy"—pictures and description.

The Ministry of Agriculture has furthered the geological and hydrographical study of the country and the interests of agriculture by the establishment of a Geological Institute, and the organization in the Ministry itself of an Hydrographical Department and the Meteorological Institute. The Ministry of Commerce regulated the Iron Gates of the Danube. The National Statistical Office, working under its jurisdiction, is an institution possessed of far-reaching apparatus, and is supported in its enormous work by the Statistical Office of the City of Budapest. The Royal Hungarian State Printing Office, which is under the jurisdiction of the Ministry of Finance, has in the field of cartography produced many excellent works.

The Ministry of Public Instruction has regulated the teaching of geography in elementary, middle, and technical schools. At the University, candidates for posts as teachers may receive practical instruction in the Geographical Seminary. By helping candidates and teachers to make journeys abroad, and by arranging trips for purposes of study, the Ministry for Public Education has created a new and practical method of securing knowledge. To the moral and material support of the Ministry is due the foundation of the Hungarian Geographical Institute, which has all maps, atlases, globes, and other instruments used in teaching geography and history made at home, so rendering foreign articles entirely superfluous.

The Ethnographical Society, which is in connection with the National Museum, though of quite recent foundation, has been considerably enriched by the collection of exclusively Hungarian

learned works. Through the generosity of the Ministries of Public Education and Agriculture, the Balaton Committee of the Geographical Society has made researches and published a work of several volumes on Lake Balaton. Besides its other work, the Geographical Society is engaged in the publication of a large atlas and has founded the Geographical Library. In the popularization of science, much is due to the Urania Theatre of Sciences, which has been working for several years, and has produced more than one hundred geographical pieces dealing with the beauties of Hungary and of foreign countries. Among discoverers and explorers we find the names of Ladislaus Magyar, Count Maurice Benyovsky, Csoma Körösi, Xantus, Vambéry, Louis Biró, Aurelius Stein, Count Samuel Teleki, and the expeditions of Count Béla Féchenzi and Count Zichy, who, together with others whose names have not been mentioned, occupy an honourable place in the list of the distinguished servants of science.

NOTES ON TOPOGRAPHIC SURVEYS IN ALASKA, 1904.

The rapid advance in the development of the mineral resources of Alaska has led to such a demand for geologic surveys of the mining districts that, for the present, the United States Geological Survey has been compelled to postpone further exploratory surveys. The work of the past season has, therefore, been rather in the nature of the extension and amplification of previous surveys than of the mapping of new areas. Three parties have carried on topographic surveys in Alaska: one in the Yukon-Tanana belt; one in the Kenai Peninsula; and the third in the Nome district of the Seward Peninsula. The surveys in the Tanana-Yukon region covered an area extending westward from the Fortymile Quadrangle to the special map of the Fairbanks and Birch Creek districts, made last year. These surveys covered an area of approximately 4,500 square miles, on a field scale of 1:180,000. The weather conditions were such that much time was lost; or a considerably larger area would probably have been mapped.

The party working in the Kenai Peninsula made a reconnaissance survey northward from Resurrection Bay, including the Sunrise placer district. This work, which is of the reconnaissance

type, was on a field scale of 1:180,000, and covered an area of approximately 2,000 square miles. During the latter part of the season the party extended its work southward along the western margin of the Kenai Mountains to Kachemak Bay. This part of the journey was through a region that was little known and was more or less of an exploratory character. The physical obstacles to travel and the bad weather conditions made it impossible to carry on a continuous survey throughout this belt, but the larger features of the topography were sketched and some positions determined.

The most novel feature of the Alaskan topographic work this season was the preparation of a special map of a part of the Nome mining district. The demand in this region, where hundreds of thousands of dollars are being invested in mining plans, has been for more detailed surveys than the ordinary reconnaissance work. As the production of placer gold is constantly increasing, it seemed desirable to make a special map of this area, and the field scale of 1:45,000 was chosen for this purpose. This map will be used as a base for detailed geologic work, and will also be of immense value in connection with the extensive hydraulic engineering works which are being undertaken for the development of the gold placers. The area covered embraces about 460 square miles, stretching northward from Nome, and includes some of the richest placer grounds of the district.

The control for this work was obtained from the triangulation of the U. S. Coast and Geodetic Survey. While it does not seem feasible now to cover the entire peninsula by this character of mapping, it seems probable that there are several areas of especial economic importance where there will be a demand for this kind of work. For the general purposes of the prospector and explorer the maps published on a scale of 1:250,000, or 4 miles to one inch, seem ample; while, where more detail is demanded, only the special, large-scale maps would fulfill the requirements. It will probably be many years before it is worth while to carry on systematic surveys on the larger scales in Alaska, as is now done in the States.

Besides the surveys made by topographers, two geologic parties have contributed some geographic data. The one, while making a reconnaissance of the coal fields of Cape Lisburne, on the Arctic coast of Alaska, made sketch traverses of several hundred square miles of a region which is practically unexplored; another party carried on a rough reconnaissance survey along the western shore of Cook Inlet—this latter work being checked by latitude and

azimuth observations and intersections on points of known position. While the work of these two parties cannot be compared with the instrumental surveys of the regular topographic parties, yet inasmuch as it is done at small cost in regions which will probably not soon be accurately surveyed, it will produce results of considerable value; for they serve not only as bases for the geologic and economic maps, but also are a great improvement on the present cartography of the region.

BOOK NOTICES.

Voyage au Rio Curuá, 20 Novembre 1900–7 Mars 1901. Ouvrage illustré de 34 Vignettes et de 1 Carte.—Voyage à La Mapuerá, 21 Avril 1901–24 Décembre 1901. Ouvrage illustré de 36 Vignettes et de 1 Carte.—Voyage au Maycurú, 5 Juin 1902–12 Janvier 1903. Ouvrage illustré de 57 Vignettes et de 1 Carte. Par O. Coudreau. Paris, A. Lahure, Imprimeur-Éditeur, 9 rue de Fleurus, 1903. 3 vols. 4to.

Madame Coudreau is an excellent traveller, with a passion for exploring the great solitudes of the Brazilian forests.

The region described in these three volumes lies to the north of the Amazon, in what is known as Brazilian Guiana—a land of rivers and water-courses, with many rapids and falls. Navigating these rivers was slow work, and it was not always easy to get a night's rest in camping, disturbed as the voyagers were by ants and mosquitoes, by thunderstorms, and sometimes by the passage of a drove of peccaries. The vampire-bat was a frequent visitor, and, in spite of quinine, fever attacked the party.

Madame Coudreau declares (*Rio Curud, p. 107*):

> I am charged with the survey of rivers and with scientific exploration; commerce and exploitation are no concern of mine.

None the less, she notes the wealth of these forests in precious woods and the abundance of rubber-trees, practically inaccessible so long as the only approach to the interior is by way of the streams.

The inhabitants of this region are of various races, strangely mixed, and attractive only to the anthropologist, if even to him.

They seem to have learned but little of civilization, and yet to have lost some of the distinctive traits of the traditional noble savage.

The illustrations in these books are most interesting, and the maps, 14 sheets in all, on a scale of 1:100,000, admirably printed in colour, are in every way creditable to Madame Coudreau, who honours the memory of her husband by continuing with scientific method the work so well begun by him.

North America. By Israel C. Russell. VIII plates (colored maps) and 39 figures in text. D. Appleton & Co. Pp. x + 435.

This volume is intended to give a condensed "readable account of the leading facts concerning the North American continent which, from the point of view of the geographer, seems most interesting and instructive." This is the expressed purpose of the author, and the purpose has been successfully carried out.

The area of the continent is so vast that completeness of treatment is out of the question in a volume of this size. To the American reader it seems singularly inappropriate that but a single volume in this *Regions of the Earth* series should be given to the North American continent, while five volumes are devoted to Europe. The limitations of space are felt at every point. While it is true, as the author indicates in his preface, that our recorded knowledge is incomplete in many points, it is not so incomplete or so inadequate that any very large part of that which is known of the geography of North America, and which is interesting and instructive, can be got into one volume of little more than 400 pages. Had two or three volumes been devoted to the continent it would have been possible to treat many topics more satisfactorily and to have introduced many things which are necessarily omitted.

1, The Margin of the Continent; 2, The Topography of the Land; 3, The Climate; 4, The Plant Life; 5, The Animal Life; 6, The Geology; 7, The Aborigines; and 8, The Political Geography, are the titles of the eight chapters which the book contains. Economic geography receives but little attention, as the author recognizes in his preface; but the slight development of this phase of the subject is due, not to lack of appreciation of its importance, but to lack of space.

The chapter on "The Margin of the Continent" contains much material which is not ordinarily found in text-books, and will be helpful to many students and teachers. This chapter is, on the whole, one of the most satisfactory of the book, largely because it is less abbreviated.

Topographically the continent is divided into five parts. These are (1) the Coastal Plains and Plateaus, of which the country between the Atlantic Ocean and the Appalachian Mountains affords typical examples; (2) the Atlantic Mountains, as the mountains of the eastern part of the continent are called; (3) the Continental Basin, which includes the great area between the eastern and western mountains; (4) the Pacific mountains, which include the Rockies and all the area to the west of them; and (5) the Caribbean Province. The topography of these several provinces, most of which are subdivided, is briefly characterized, and their salient features effectively brought out. No other equally brief description does this so well.

The chapter on climate is really a chapter on meteorology and climate. At first thought one is disposed to doubt the propriety of discussing the elementary principles of meteorology in such a book, but it is possible that popular knowledge on this subject is in such a state as to make this discussion necessary. The chapter outlines the various climatic provinces, and gives an account of each. The map showing climatic provinces might well have had some fuller explanation. As we understand it, this map is based on temperature rather than on climate.

The chapter on plant life, devoted chiefly to trees, especially to those of economic importance, is, in general, an excellent one. The author is right in making water more important than temperature as a determinant of broad differences in vegetation. The botanist may think that sufficient attention is not given to the interesting plants of the arid region. The cactus and other arid types of Mexico are classed with the tropical forest, and the sagebrush seems to form an appendix to the prairie. Most botanists divide land vegetation into forest, grass-land, and desert, making three divisions of co-ordinate rank.

In discussing the origin of prairies the author omits one of the factors that is scarcely second to rainfall in importance, namely, windy winters, which induce high and ruinous transpiration. Argentina, with heavy rainfall, has prairies for this reason.

The chapter on animal life deals with mammals and birds. In addition to a brief and very general statement concerning these animals, a fuller account is given of various interesting species, such as the bison.

In the popular style of writing which is necessary in such a volume, and with the author's limitations of space, some statements appear which might well have been modified, qualified, or expanded.

Thus, continental shelves are stated (p. 6) to be largely constructional forms. While this statement is true, there is in this connection no statement as to any other possible origin. It would probably have been equally true, for example, to say that the continental shelves are largely the result of crustal movements, or of wave-cutting. Again, berg-carried debris (p. 7) is said to be deposited mainly on the coastal shelves, because the cold currents which carry the bergs follow the coast. While this statement is not untrue, a better reason is that bergs do not carry much debris far, after they set sail. Little debris is carried by Greenland bergs a distance equal to the width of a wide coastal shelf. The banks of eastern Newfoundland are said to be "probably due in large part to debris deposited by the glaciers." These banks are very likely covered by glacial debris, but that the banks are primarily of glacial origin is extremely improbable. Again, the statement (p. 27) that "the great elevations arising from the floor of the 'deeps' (Caribbean region) are upraised blocks of the earth's crust," might have been supplemented by the at least equally plausible statement that the "deeps" are sunken blocks of the earth's crust. The same comment might be made concerning the statement on page 96. Shaler is cited (p. 26) as saying that sand grains "are not worn out." The reason assigned is "that after the sand grains have been reduced to a certain size, they retain films of water, which separate them from one another and act as cushions which prevent the grains from coming in contact, thus greatly retarding their comminution." The last clause of the quotation implies, and correctly, that sand grains may be worn out, but the reason for their slow reduction when they become small is much better stated in another way. The small grains retain no thicker films of water than large ones; but when the grains get sufficiently small they have little momentum when moved, so do not strike one another with force enough to effect much wear, the film of water helping to protect them. The statement that thunderstorms are unknown in the Far North should be modified so as to read that thunderstorms are very rare in that region. They are not quite unknown.

Certain statements, too, will occasionally confirm popular misapprehensions; thus, it is stated (p. 11) that "at the north there are six months of sunlight and six months of darkness each year." This is what most teachers teach their pupils. Whatever the teacher may understand by the expression, the pupil generally understands that almost anywhere far north of the place where he lives, and certainly north of the Arctic Circle, there is a period of

six months of uninterrupted sunlight followed by a period of six months of uninterrupted darkness—an understanding which is far from the truth.

A few errors which are typographic, or slips of the pen, may be noted. Thus Lianas (p. 219) are not "aërial roots," but vines. Iron mountain is located (p. 92) in the northeastern part of Missouri. Ouachita is said (p. 93) to be pronounced "Wichitaw" (instead of Washitaw), etc.

All these are minor matters, and since they are mentioned it should be added that in view of the limitations of space imposed on the author it would have been difficult to have prepared a more acceptable book. It is so thoroughly readable and reliable that it ought to have wide use. The maps are Bartholomew's and are excellent. S.

The Cyclones of the Far East. By Rev. José Algué, S. J., Director of the Philippine Weather Bureau, Manila Observatory. Department of the Interior, Weather Bureau. Second (revised) Edition. 4to. Manila, 1904. Pp. 283, Pls. LIV, Figs. 6.

The work of the Manila Observatory was begun under the auspices of the Jesuit Fathers in the year 1865. The first storm warnings were issued by Father Faura in 1879. The meteorological investigations carried out at this Observatory have since become known all over the world, and now that the Philippine Weather Bureau has been established (1901) under the American Philippine Commission, the work is rapidly being extended and improved. Although active along many lines, the Philippine Jesuit Fathers have always laid the chief emphasis on the study of the typhoons of the Philippine region, for these are not only the most interesting, but also the most dangerous of all meteorological phenomena in the Eastern Seas, and over the immediately adjacent land areas. The first report upon these typhoons was issued in 1897, under the title *Baguios ó Ciclónes Filipinos, Estudio teórico-prdctico*, a quarto, paper-covered monograph of 307 pages, which was at once welcomed as the most complete discussion of the subject, and took a very prominent place in the literature of cyclonology. This book was translated into German by Dr. Paul Bergholz under the title *Die Orkane des fernen Ostens* (1900), and Dr. Robert H. Scott, formerly Secretary of the Meteorological Council of the Royal Society, translated Dr. Bergholz's translation into English (*The Hurricanes of the Far East*, 1901). Father José Algué, who wrote the original mono-

graph of 1897, has now brought out a second, revised edition of this useful work, choosing the title, *The Cyclones of the Far East*, as showing more clearly the scope of the work, which really relates to a wider area than that of the Philippines alone.

The lapse of time between 1897 and 1904 has made possible the collection of abundant new data, not only from the Philippines themselves, but from the adjacent coasts, and these are embodied in the new edition, which is very fully illustrated, and is also bound. All the excellent characteristics of the first edition are here preserved, and many new things are added, so that the book before us is in reality almost a monograph on tropical cyclones as a whole—so full are the bibliographical references and discussions,—rather than on the storms of one special tropical district. The work is divided into four parts. Part I, *The Cyclones*, deals with the elements, origin, structure, pressure, rain and cloud areas, movements, tracks, frequency and classification. Part II, *Precursory Signs of Cyclones*, takes up the clouds, indications of cyclones given by clouds, cloud photography and weather forecasting, indications given by the direction of the wind and by the barometer, as well as by the ocean-swell, and by other indirect signs. In Chapters VI and VII Father Algué's very ingenious instrument, the barocyclonometer, is described and explained much more thoroughly than in the first edition. This is a combination of an aneroid barometer and of a cyclonometer, or wind disk, and when properly used, has been found to be of the greatest assistance in making forecasts of approaching cyclones, and in determining the location of the observer with reference to bearing and distance of the centre. One of these instruments was shown in the Philippine Weather Bureau exhibit at the St. Louis Fair. In Part III, *Typical Cyclones*, special storms are fully described and discussed, and part IV, which is new, *Notes on Cyclones of Interest to the Sailor*, deals with some practical rules for navigating in case of encountering a typhoon, and gives a list and descriptions of the ports of refuge which may be used by vessels during storms in the Far East, especially in the Philippine Archipelago. Other new features are a new classification of the cyclones of the Far East; a study of the frequency of cyclones in certain districts and months; the relation between the average motion of the higher clouds in the Northern Hemisphere and the general tracks of cyclones, and a discussion of some remarkable barometric minima observed during cyclones.

Taken altogether, *The Cyclones of the Far East* is a work which will be indispensable to all students of meteorology who go beyond

the very limited discussion of the ordinary text-book, and especially to mariners of all nations whose business takes them into those seas of the Far East, which are the home of the dreaded typhoon. R. DEC. W.

Report on the Climate and Weather of Baltimore and Vicinity. By Oliver L. Fassig. Maryland Weather Service. Special Publication, Vol. II, Part 1a. 4to. Baltimore, 1904. Pp. 29–147, Figs. 38, Pls. VII.

In 1899 there was published, as Volume I of the Maryland Weather Service, the most elaborate report which has ever been issued by any State Weather Service in this country. In the Preface to that volume Professor W. B. Clark, of Johns Hopkins University, the Director of the Maryland Weather Service, said: "The present volume is the first of a series of reports dealing with the climatic features of Maryland. Much work has already been done in the preparation of the subsequent volumes, and they will follow from time to time as the investigations are completed." We now have before us Vol. II, Part 1a, a *Report on the Climate and Weather of Baltimore and Vicinity*, by Dr. Oliver L. Fassig, Section Director of the United States Weather Bureau, and also in charge of the instruction in Meteorology and Climatology at Johns Hopkins University, a man well equipped for such a task as he has here accomplished.

In his *Handbuch der Klimatologie*, Vol. I, Dr. Hann, the leading climatologist of the world, has enumerated the data which it is necessary to present in order that a complete account of the climate of any locality may be given. The list of these data is not a short one, and it has thus far been given in its entirety for comparatively few stations, and those in Europe. For this country, until the publication of Dr. Fassig's report on the climate of Baltimore, we had nothing approaching such completeness of climatic presentation. Our author has therefore blazed a new trail for himself, in so far as the United States are concerned, and he deserves, and will receive, the thanks of his fellow-workers in Meteorology and Climatology for the valued example which he has set, and which it is hoped may be followed in many other places. And Dr. Hann may well be gratified to see the lessons which he has taught in his invaluable *Handbuch* so well-learned and applied. One who is familiar with the *Klimatologie* will recognize the inspiration

gained from that book throughout the present volume on the climate of Baltimore.

The general plan of the report is to give a complete presentation of the climatic conditions of Baltimore, as determined by the regular Weather Bureau observations in that city (thirty years), supplemented, in some cases, by a longer series of records from 1817 on. The present volume concerns pressure and temperature, the remaining factors—humidity, cloudiness, precipitation, winds and electrical phenomena—being reserved for a later issue, which is now in press. In general, each element is discussed from the point of view of (1) its regular annual and diurnal periods, and (2) its non-periodic periods of long or short duration. Under temperature, for example, we find the following matters considered: Diurnal march of temperature, mean hourly temperatures (from Richard thermograph); corrections to reduce to the true daily mean; the normal variability for each day, and departures from the normal; the mean diurnal variability; the daily extremes of temperature; monthly and annual means, with departures from the normal values; probable error of monthly and annual means; variability of temperature conditions; frequency of cold and of warm days; analysis of periods of great heat and of great cold; time of occurrence of annual extremes; frosts. This enumeration will serve to give to those unacquainted with the details into which thorough climatological studies should go some idea of the completeness of the discussion of Baltimore climate in the present volume. All these matters are worked out with great care, and are fully illustrated by means of tables, curves and diagrams. Dr. Fassig has made use in several cases of a useful form of diagram employed by Köppen and others in Europe, but seldom used in this country (*e. g.*, isopleths of hourly pressure, p. 36; isopleths of hourly temperature, p. 62; hourly rate of change of temperature, p. 74).

The volume contains much that will interest a Baltimorean who wishes information concerning the temperature records of his city; it should serve as a standard for many similar investigations in different cities all over the United States, and it will help to remove the stigma which now rests upon us of being far behind Europe in the completeness and the accuracy of our climatological discussions. We note with particular satisfaction that Part II is to deal with the *weather* of Baltimore, for we have had altogether too much of *annual* and *monthly* and *diurnal* averages, and too little of the irregular, cyclonic variations which are such important weather-

makers in our North Temperate Zone. In this connection, in the volume before us, we take pleasure in calling special attention to the emphasis laid on cyclonic controls in the discussion of the effect of cloudiness and rain on the hourly variations of temperature (pp. 66–68, with typical curves), and in the typical barograms (Pl. II) and thermograms (Pl. V), although the latter diagrams are crude and hardly up to the general standard of the book as a whole. R. DEC. W.

Geschichte und Herkunft der schweizerischen Alpenflora. Eine Uebersicht ueber den gegenwaertigen Stand der Frage. By Marie Ch. Jerosch. pp. 253. Leipzig, 1903. W. Engelmann (8 marks).

This work is in the nature of a critical compendium of the materials derived from all sources bearing upon the problem stated in the title, "The History and Origin of the Swiss Alpine Flora." By "Alpine" we are to understand that flora, the species of which have their occurrence-centres (Schwerpunkt) above the timber limit, which, in the Swiss Alps, has an average elevation of 1900 meters. The author has had no mean task before her in collating and digesting the very large amount of literature contributory to the solution of the problem stated. Evidences have been gathered from all sources; the hypotheses based upon them have been critically examined, and the conclusions, so far as it has been possible to draw them in the light of present knowledge, have been set forth. The character of the material makes the book of interest and value not alone to the botanist, but to the geographer, geologist and palæontologist. Its scope may be briefly stated as follows:

In Chapter I, the author states the aim of her work, and discusses the conceptions and assumptions pertinent thereto.

The features of the Swiss Alpine and Arctic climates are stated and compared in Chapter II.

Chapter III deals with the history of the Diluvium. Accepting Penck's earlier division of this period into three glacial and two interglacial epochs, the attempt is made to form an estimate of the climatic conditions which probably existed at these various times. The view is accepted that at the period of most widespread glaciation, a strip of non-glaciated country existed, which supported, in its cold, wet climate, an arctic and sub-arctic flora. The elements of this were alpine and arctic plants, which, unable to withstand the extremely unfavorable glacial conditions, here mingled together. There is no evidence that phanerogams were able to outlive the

glacial period in Scandinavia—and only a few such survived in the Alps.

In Chapter IV, the evidence is accepted as certain that there existed during the second interglacial epoch a steppe-period characterized by a fauna and flora peculiar to arid conditions.

A short chapter (V) deals with the climatic changes of the Post-glacial. There is no evidence that there have been changes of such magnitude as to produce any permanent effect on the flora.

A brief review of the history of the flora of Middle Europe follows in Chapter VI, while the next three chapters (summarized in the tenth) deal specifically with the Swiss Alpine flora (pp. 70–158). The results arrived at are far too complex to admit of a condensed statement.

The remainder of the volume (pp. 161–253) is occupied by tables embodying the various views held as to the division of the Diluvial (Tab. I), and of the Post-glacial (II), and by an extended table (III) showing the distribution of the Swiss Alpine species as at present understood. A full bibliography, and full explanations to complement the tables, together with an index, occupy the rest of the space.

Every student of plant geography will find this book essential to his working library. F. E. L.

The Silent Trade. By P. J. Hamilton Grierson. X and 112 pp., with a list of the authors cited. William Green & Sons, Edinburgh, 1903.

By Silent Trade (*Stummer Handel*, as the Germans call it) the author means a class of commercial exchanges, which in their simplest form are transactions between persons who not only do not address, but do not see one another. Another form of the silent trade is that described by Herodotus as employed by the Carthaginians in their dealings with an African people. The Carthaginians would unload their wares along the beach, return to their ships, and raise a great smoke. The natives, seeing the smoke, would go to the shore, leave gold there and withdraw. Then, the Carthaginians, coming ashore, would take the gold and go their way if they thought it sufficient; if not they would return to their ship, and the natives would add to the gold till the traders were satisfied. Neither party dealt unfairly with the other.

Traces of this silent trade are found in every quarter of the

globe, and in recent years it has been described by explorers as still existing among some barbarous peoples. Mr. Grierson, with great industry, has brought together a large number of passages from ancient and modern writers bearing upon the practice, and has worked out from this great collection of data a plausible theory as to its origin.

A primitive hunter evolves the idea that a man of another tribe has desirable things that may be more easily or simply obtained by peaceful than by violent methods; and as one good turn deserves another, the hunter places something tempting where the other man will find it, in the hope that it will be accepted as a gift and that the stranger will leave something of value in exchange. If his scheme succeeds the transaction is repeated and finally becomes a practice. These trysting places finally become inter-tribal markets, and trade by barter or sale succeeds the silent trade.

Burnaby's Travels Through North America. Reprinted from the Third Edition of 1798. 265 pp., including introduction, appendices, notes, and index. Introduction and notes by Rufus Rockwell Wilson. A. Wessels Company, New York, 1904.

The author was the well-educated son of an excellent English family, who, when about twenty-five years old (1759–60), travelled through the American colonies from Virginia to Massachusetts and New Hampshire. He saw the colonists at a critical time, only a few years before the Revolutionary War, and his comments on them and the development they had attained were acute as well as kindly and interesting. He speaks of the Virginians as haughty and jealous of their liberties, impatient of restraint; they could scarcely bear the thought of being controlled by a superior power. The Pennsylvanians were frugal and industrious, but not remarkably courteous and hospitable to strangers. "They have fallen into the same errors in their ideas of independency; and most of the other colonies have." When he visited Princeton it had two professors, besides the Provost, and invested funds amounting to $10,000. Each professor drew a salary equivalent to $250. The men of New Jersey were gentlemen farmers, and the settled portion of New York City was a mile long and about half a mile wide. This book, which is one of the excellent series of "Source Books of American History," will help towards fuller and more accurate knowledge of the troublous times in the colonies on the eve of the struggle for independence.

A Travers la Mandchourie. By Captain H. Enselme. ix and 196 pp., 26 illustrations, 3 plans of towns, and a map. J. Rueff, Paris, 1904. (*Price, 3.50 frs.*)

The author, a French army officer, and a comrade, travelled through Manchuria in 1901, before the completion of the Manchurian railroad. Among the halting-places on their way were Tien-tsin, Newchwang, Port Arthur, Mukden, Harbin, and Vladivostok. They were greatly impressed with the activity of the Russians in pushing the railroad forward, and with their celerity in settling Russian colonists in the new territory. They saw in Manchuria a land so richly blessed with widespread fertile soils and waterways, forests, coal, and minerals that there can be no doubt of its capacity to support many millions of people. This fact is evident to all careful observers; but the writer was mistaken in his conclusion that the railroad would assure the pacific conquest of Manchuria by the Russians, the entire government of the country passing from Peking to St. Petersburg.

The crowning merit of the book is that it is a careful record of the impressions and observations of a conscientious and well-equipped student of the country. Few Western travellers in Manchuria have had the opportunity to make a careful study of it. This book will fill a useful place, because, though not exhaustive, it is neither flighty nor superficial. The photographs, very characteristic of the country and its people, were all taken for the book by the author's comrade.

English–Kikuyu Vocabulary. Compiled by A. W. McGregor. 192 pp. Society for Promoting Christian Knowledge, London, 1904. (*Price, 2s.*)

The vocabulary was collected by Mr. McGregor during his two years' residence in the Kikuyu district of the British East Africa Protectorate. This region, which includes Mount Kenia, and is practically on the Equator, is from 4,000 to 7,000 feet above the sea in its inhabited portions, and, being suitable for Europeans, colonists are beginning to move in. The vocabulary is, therefore, likely to be of use in the dealing of the whites with the natives.

Le Mozambique, by Almada Negreiros, 198 pp. and 13 maps and illustrations. Augustin Challamel, Paris, 1904.

The book gives a glowing view of Portuguese East Africa, and shows a lively appreciation of the talent of the Portuguese for colonial enterprise. The flora and fauna of Mozambique are treated

with especial fulness, and much information is given about all parts of the vast domain. No adequate credit appears to be assigned to the foreign capital, experience and energy that had much to do with the development of the port works of Lourenzo Marquez and the railroads between that port and Johannesburg and between Beira and Salisbury.

Glossary of Geographical and Topographical Terms. By Alexander Knox. XL. and 432 pp. Edward Stanford, London, 1904. (Price, 15s.)

The Glossary is intended as an aid to the readers of maps and geographical works. The spelling of names conforms, for the most part, with the rules adopted by the Royal Geographical Society, but the fact that other spellings are also frequently given will be helpful to many readers. This may be illustrated by "Hoang," a very common spelling of the name of the second largest river of China. Turning to the word in the Glossary, we are referred to "Hwang," now generally accepted by leading writers as the best representation, for English-speaking readers, of the Chinese pronunciation of the name. Here we find:

Hwang (China), yellow; frequently misspelled Hoang, Huang. Hwang-ho—Yellow River. See Ho.

If the discredited spelling—Hoang—had been excluded, many readers would be less likely to see the approved English transliteration of the name.

This is a pioneer work of its kind. It does not clash with Dr. Egli's "Nomina Geographica" or Dr. Ganzenmüller's definitions of geographical names. It will be helpful at the elbow of all thorough English-speaking students of geography. So much of the geographical nomenclature of many languages is descriptive of geographical or topographical aspects that a key is needed to unlock these hidden meanings which are often so graphically explanatory. The Glossary performs this service to a large extent. The book is supplementary to Stanford's Compendium of Geography, and is uniform in style with the volumes of that series.

A History of the Colony of Sierra Leone, Western Africa. By Major J. J. Crooks. xiv and 375 pp. Two maps, 6 appendices, and an index. Brown & Nolan, Limited, Dublin, 1903. (Price, 5s. net.)

A compact and careful history of this British colony, written by its former colonial secretary. As the colony was formed to provide a home for freed slaves, the volume contains much information of im-

portance relating to the slave trade and the war upon it. Many slaves landed at Sierra Leone were so enervated and sickly that they died within a year of procuring their freedom. The book gives a picture of the colony that is, to say the least, striking. Founded in 1757 with a few slaves, wrecked by native and foreign invasion, neglected by the Government, it has made much moral and material progress in spite of formidable obstacles. It now has a trade of the annual value of about $3,000,000. Its climate is not healthful; but with our present knowledge of tropical hygiene, supplemented by regular tillage and the draining of the land, the climatic conditions are improving.

Richard E. Dodge, Elementary Geography, pp. 231, 375 maps and illustrations (Price, $.75). Chicago, Rand, McNally & Co., 1904.

This elementary geography is an excellent illustration of the modern spirit and method applied to a book for beginners. The text is divided into two parts: first, Home Geography, and second, World Relations and the Continents. This separation has been made without repetition by introducing the more general material on such subjects as roads, the land surface, rivers, soils, and the atmosphere into the first part. For the second part is reserved the account of the varying aspects of nature and of the life of man as they present themselves in different parts of the world.

The book opens charmingly with the idea of home, and this idea is developed by pictures which show the home of a couple of bird families and of a family of prairie dogs. Throughout the book the pictures are attractive, real, and typical. Indeed, so interesting are they that the reviewer found it hard to stick to the text, and not be led away by them. These pictures suggest two observations: First, that the pictures in text-books are very important means of education for young children. A second observation is one of thankfulness that the day of the old woodcut has passed, and every child has now the privilege of looking upon distant scenes in the world as with his own eyes.

The primary plan of arrangement of the second part of the book is geographical, the sections of the United States and the countries of the world being taken up in an appropriate order. The secondary arrangement by which the matter concerning a country is grasped is topical. Matters of a political nature are touched with a very light hand. The two classes of facts brought forward most strongly are the physical conditions, including topography, drainage and climate, and the industrial life of the people.

It is interesting to observe that practically one-half of the second part of this book is devoted to commerce and industry. By actual count, of the 64 column inches devoted to the New England States, exclusive of the general map and questions, 47 inches, or three-fourths of the space, are devoted to matters pertaining to commerce and industry. In the opinion of the reviewer, this is as it should be. In the secondary schools two sciences are competing for the right to teach industrial facts—geography and economics. Economics presents the facts of industry in a logical system, the plan of which depends upon the observed interdependencies of economic forces. The growth of such a subject as commercial geography, lying between geography and economics, has been possible because general geography on the one hand has been heretofore lacking in its treatment of the life of man as influenced by the earth, and economics has been as an entire science difficult for youthful minds to master and lacking in an account of the production of wealth. Two forces are now at work, however. Recent texts on general geography are increasing the attention paid to the life of man in its relation to the earth, and the use of facts such as are found in commercial geographies is one sign of this. On the other hand, in economics, there is a group of investigators at work systematizing the study of the production of wealth and preparing this subject so that commerce and industry may be studied in the secondary schools in a few years, after the manner of economics—that is, on a logical not a geographical plan, and yet without obliging the student to take up many of the intricate conceptions of value and distribution.

The final and proper adjustment is that the student should become reasonably familiar with the industrial conditions of various parts of the world—that is, with the geographical aspect of industry, in his general geography, and so be fitted to take up the logical study of the forces controlling commerce and industry in the study of the production of wealth, which, in turn, will lead to other parts of economics. The abundant material on the geography of industry, found in Professor Dodge's geography, is one of many signs of his clear analysis of the progress and adjustment of geographical studies. E. D. J.

Die überseeische Auswanderung der Chinesen und ihre Einwirkung auf die weisse und gelbe Rasse. By H. Gottwaldt. viii and 130 pp. Max Nössler, Bremen, 1903.

Dr. Gottwaldt gives the history of Chinese migration from early times. The movement persisted in spite of Government prohibi-

tion. For generations Chinese emigrants who returned home were liable to severe punishment, and even to the infliction of the death penalty. Theoretically the laws of the empire forbidding emigration were nullified in 1860 by the treaty between Great Britain and China, in accordance with which the Mandarins of all the provinces were instructed to permit Chinese subjects to make labour contracts with foreign employers and to emigrate to the British colonies and other foreign lands. The author describes the growth of the outbound movement to North and South America and other countries, the opportunities offered to these emigrants and their social condition abroad, the great movement of Chinese population along the southern coasts of Asia, and the extent to which women participated in it, four-fifths of them belonging to the most unfortunate class of their sex.

Emigration has had little importance in its political effect upon China. A considerable part of the emigrants have become subjects of the Government under whose rule they are living, and this is especially the case in the Asiatic countries.

The writer considers in detail the position of the Chinese in each of the countries to which they are admitted, and finds from the best available statistics that the total number living in foreign lands is distributed as follows: Formosa, 2,600,000; Siam, 2,500,000; Malay Peninsula, 985,000; Sunda Archipelago, 600,000; Hongkong, 274,543; America, 272,829; Indo-China, 150,000; Philippines, 80,000; Macao, 74,568; Burma, 40,000; Australasia, 30,000; Asiatic Russia, 25,000; Japan, 7,000; Korea, 3,710—total, 7,642,650.

The writer gives many reasons for believing that the so-called "yellow danger" is merely a bugbear. Emigration treaties and regulations are given in the appendix. Mr. Gottwaldt has developed his subject in a most thorough and systematic manner. His monograph is the outcome of laborious study, and throws much light upon a very interesting phase of human migration.

A Yankee on the Yangtze. By William Edgar Geil. xv and 312 pp., and 100 full-page illustrations. No index. A. C. Armstrong & Son, New York, 1904. (*Price, $1.50.*)

This is the narrative of a journey up the Yangtse River and through the western mountains of China to Burma. It is a plain story of what the author saw on his way—of the country, inhabitants, and missionaries, especially the latter. He testifies to the culture, kindness, and common sense of the missionary body as

a whole, and commends their business methods. At Shanghai the author turned his gold dollars over to the China Inland Mission, and received sight drafts on any place where they have central stations. He says he never saw money go farther than the missionaries in China make it go in accomplishing the purposes for which it is given. The illustrations, all photographs, are good and interesting.

Switzerland Picturesque and Descriptive, by Joel Cook. viii and 519 pp., 25 full-page illustrations and Index. Henry T. Coates & Co., Philadelphia, 1904.

This scenic description of the Alps is largely the result of the author's personal observations. He combines with his description much of the history and romance of these glorious regions, which have had so important a share in many a stirring episode of the past centuries in Europe. The book is not at all on the guide-book order, but nearly every page contains hints that will be useful to tourists. The title should really have included mention of the Rhine. The American visitors, in coming or going, usually follow the Rhine up or down, and over half of the volume is given to the panorama of this storied river, its delta and cities and the show places of the Netherlands. With the aid of first-rate maps of Switzerland and the Rhine the reader may get an excellent general idea of the whole complex of the Alps and of the régime of the Rhine from its sources to the sea.

Zwanzig Jahre in Süd-Africa. By August Einwald. viii and 136 pp., and a sketch map. Gebrüder Jänecke, Hannover, 1901.

The writer travelled extensively in South Africa and lived in several parts of it. There is little in his book, excepting in the brief historical section with which it opens, that is not derived from his own observation or experience. His material is interesting and unhackneyed and much of it is not found in the usual books of reference. He notes the presence of gold in Zululand and says it has been easy to find it in exposed reefs without a microscope. He says that the famous diamond, the Star of South Africa, came to light in this way. No one had supposed that diamonds were included among the rubbish collected by witch doctors for use in their incantations and spells; but this gem in the rough, weighing 83½ carats, was discovered near Hopetown by a farmer named Nieuwkerk in a leather pocket hung on the neck of a Kaffir wizard. Nieuwkerk traded a wagon and a number of cattle for the precious stone, which he sold for nearly $55,000.

Quer Durch Mexico vom Atlantischen zum Stillen Ocean. By Dr. Wilhelm Schiess. xiii and 234 pp., map and 71 illustrations, chiefly photographs. Dietrich Reimer (Ernest Vohsen), Berlin, 1902.

The book records the observations made by Dr. Schiess during his journey through Mexico in the winter of 1899–1900. He kept away, for the most part, from the beaten tracks and travelled with a few mules and servants through some of the lesser-known districts. His book is written on the rather unusual plan of refraining from reference to the literature on those regions, so that his work might contain nothing but his own impressions. He has keen powers of observation, a bright and vivid manner of recording what he sees, and the result is a series of glimpses along his routes of travel that are entertaining, though not scientific or thorough-going. His book would have larger value if he had combined with his own clean-cut impressions some results of the work of earlier writers, which he might have done with perfect propriety. Most of the photographs are his own, and they convey a far better idea of the variety of scenery, the incidents of travel with pack-mules and the life and industries of the common people and the Indians than is obtained from many books on Mexico. His route from Durango across the Sierra Madre to Mazatlan has perhaps never been described before, and the interesting regions he crossed between San Blas and Lake Chapala are not very well known.

Geistige Strömungen im heutingen China. By Dr. O. Franke. 29 pp. Berlin: Dietrich Reimer (Ernst Vohsen), 1904.

This is an interesting and able paper, read by Dr. Franke before the Berlin-Charlottenburg branch of the German Colonial Society, in which he describes some significant phases of the intellectual life of the Chinese of to-day. He treats, perhaps more comprehensively than other writers have done, of the recent reform movements in China, and of the intellectual unrest and the dissatisfaction with China's condition which have seized upon many of the educated Chinese, and particularly upon her young men who have been educated in the schools of Japan and the Occident. Dr. Franke shows how foolish, untimely, and tactless have been the rash pronunciamientos of many of the reformers. Some of them have the wildest socialistic ideas.

He adds that Europe has been mistaken in supposing that the so-called reformers are moved by impulses friendly to Western foreigners. Both the old Conservatives and the young Radicals are moved rather by fear and hatred of occidental influence and

power. They differ only as to the means to be employed to ward off the dangers which they believe threaten the integrity of their empire. The author gives many quotations from recent writings of the Progressivists, who keenly dissect the weaknesses of their country and point clearly to the dangers of longer adherence to the policy of ages. He does not venture to prophesy how it will all end, but says it behooves the Western nations to see that the gulf between them and the Chinese becomes narrower rather than wider; and he believes the influence of Japan upon her neighbour is not tending toward this desirable end.

Geografia della Colonia Eritrea. By Captain A. Mulazzani. 146 pp., 52 illustrations, and a map. Florence: R. Bemporad & Figlio, 1904.

This handbook is a concise and excellent summary of the geographical features of Eritrea, its climate, resources, towns, tribes, languages, and history, including the war with the Emperor Menelek and the various boundary disputes. The Government organization is outlined, and the meaning of many words in the Abyssinian, Arabic, and other languages used in the geographical nomenclature is defined. The book is worthy of an English rendering as an adequate though brief account of the little colony, whose great diversity of altitudes gives it temperate as well as torrid conditions. The map, unfortunately, is on so small a scale that many place-names mentioned in the text are not found on it.

NOTES AND NEWS.

THE NEXT MEETING OF THE SOCIETY will be held at Mendelssohn Hall, No. 119 West Fortieth Street, on Tuesday, December 20, 1904, at 8.30 o'clock P.M.

Mr. Alfred H. Brooks, of the U. S. Geographical Survey, will address the Society on the Exploration of Alaska.

MR. F. H. NICHOLS IN INDIA.—After a few weeks' stay in Burma, Mr. Nichols entered Bengal, and at the date of the last letter received from him (October 7) was at Darjiling, where he had the pleasure of meeting Col. Younghusband, lately returned from Lhasa. Darjiling is not much more than 40 miles to the southwest from Chumbi on the border of Tibet.

U. S. BOARD ON GEOGRAPHIC NAMES. DECISIONS, NOVEMBER 2, 1904.—ANTHONY; ponds (chain of three), tributary to Long Lake near foot, Hamilton County, N. Y. (Not S. Anthony nor St. Anthony.)

BERNARD; township in Somerset County, N. J. (Not Bernards.)

BIG BAY DE NOC; bay, Delta County, Michigan. (Not Bay d'Enoc, Bay de Noq, Bay de Noque, Bay des Noquet, Bay des Noquets, Bay de Nocquet, Bay de Noquette, nor Bay d' Enoquet.)

CASADEPAGA; river on Seward Peninsula, Alaska. (Not Koksuktapaga nor Casa-de-paga.)

CORNER; pond between Long Lake and Catlin Lake, Long Lake township, Hamilton County, N. Y. (Not Belden.)

DEARING; P. O. and R. R. Station, Montgomery County, Kansas. (Not Deering.)

DILLE; bottom and R. R. Station, Belmont County, Ohio. (Opposite Moundsville, W. Va.) (Not Dillies, Dilly's, nor Dillon's.)

DILLES BOTTOM; P. O., Belmont County, Ohio. (Not Dille, Dille's, nor Dilly's.)

DIX; river, Ky. (Rockcastle, Lincoln, Garrard, Boyle, and Mercer Counties.) (Not Dick, Dyck's, Dicks, nor Dick's.)

FORGE; river in the town of Brookhaven, Suffolk County, Long Island, N. Y. (Not Mastic.)

HARPURSVILLE; village, Post Office, and R. R. station, in Coleville, Broome County, N. Y. (Not Harpurville nor Harpersville.)

JENKINS; pond or lake, Altamont town, Franklin County, N. Y. (Not Lake Madeleine.)

JUNCTION; P. O. and R. R. station, Boyle County, Ky. (Not Junction City.)

LAFERTY; P. O. and R. R. station, Belmont County, Ohio. (Not Lafferty.)

LITTLE BAY DE NOC; bay, Delta County, Michigan. (Not Bay d'Enoc, Bay de Noq, Bay de Noque, Bay des Noquet, Bay des Noquets, Bay de Nocquet, Bay de Noquette, nor Bay d'Enoquet.)

LITTLE SIMON; pond or lake, town of Altamont, Franklin County, N. Y. (Not Lake Willbert nor Little Simons.)

LONG; pond, tributary to Jenkins pond, town of Altamont, Franklin County N. Y. (Not Heaven nor Heavens.)

MCMAHON; creek, Belmont County, Ohio; tributary from the west to the Ohio at Bellaire. (Not McMahans, McMahan's, McMahon's, nor M'Mahon's.)

MASHOMACK; southeast point of Shelter Island, Suffolk County, N. Y. (Not Mashomuck, Meshomac, nor Meshomuck.)

MATTITUCK; pond in Southold, Suffolk County, Long Island, N. Y. (Not Maratooker, Marratooka, nor Mameweta.)

MULHOCKAWAY; creek, in Union township, Hunterdon County, N. J. (Not Mullackaway nor Big Brook.)

PICKWACKET; pond in Long Lake township, between Long Lake and Catlin Lake, Hamilton County, N. Y. (Not Pickwocket nor Pigwaket.)

PORT MURRAY; P. O. and R. R. station, Warren County, N. J. (Not Port Murry.)

SHELBY; P. O. and R. R. station, Boyle County, Ky. (Not Shelby City.)

SPARTA; mountains, Sparta and Byram townships, Sussex County, N. J. (Not Wallkill.)

STEEL; P. O. Steele District, Wood County, W. Va. (Not Steele.)